THE IRON AGE — August 31, 1933

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THE IRON AGE PUBLISHING COMPANY

F. J. FRANK, *President* G. H. GRIFFITHS, *Secretary* C. S. BAUR, *General Advertising Manager*

PUBLICATION OFFICE: N. W. Corner Chestnut and 56th Sts., Philadelphia, Pa.

EXECUTIVE OFFICES: 239 West 39th St., New York, N. Y., U. S. A.

Member, Audit Bureau of Circulations
Member, Associated Business Papers

Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50, including duty; Foreign, $12.00 a year. Single Copy 25 Cents

Cable Address, "Ironage, N. Y."

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..THE IRON AGE..

AUGUST 31, 1933

ESTABLISHED 1855 Vol. 132, No. 9

Smoothing the Path of NRA

WHEN the organized labor lobby dictated the terms of famous Section 7 of NIRA, they placed a serious obstacle in the path of the recovery movement. As successive industries have traveled the road to codification they have bumped against this with damaging results.

IF Section 7 had not been dragged into the recovery act, industry would probably have been completely codified by this time and we should not have had the serious and disturbing labor discontent which this section has fostered. But Section 7 is in the act and must be dealt with.

IT *is* being dealt with, to the chagrin and discomfort of the professional trouble makers, who hoped to stampede American workmen into a one hundred per cent union dues-paying body through misinterpretation of Presidential intent.

GENERAL JOHNSON has made it clear that there are two sides to Section 7, although our labor-ridden legislators were careful to express only one of them in the terms of the act.

NO one, now, need be misled into the belief that he must become a "union card man" in order to gain higher wages and shorter hours under the recovery act, or that the paying of dues to any group will aid him one iota toward these ends.

NO ambitious and independent workman need now be stampeded into hasty adherence to any particular organized group sponsored by professional agitators; no longer need he interpret representation as synonymous with accepting leadership from self-seekers outside his own ranks.

MANY weeks ago we predicted the troubles that the NRA would experience because of Section 7 and its political use. Now that the Administration is hewing a path around this obstacle, we predict smoother going for codes and rougher going for labor opportunists.

Cultivate New Fields fo To

THE bonanza outlets of today are likely to be the declining outlets of tomorrow. Sales executives in the metal-working industry, as elsewhere, cannot afford to overlook the law of diminishing returns which tends to bend their customers' volume curves into the well recognized "S" shape that spells "stop, look and listen." *

Steel executives, says Mr. Murphy, can steer clear of the S curve effect in their own business if they will recognize it in that of their customers and diligently cultivate new fields for tomorrow's sales harvest.

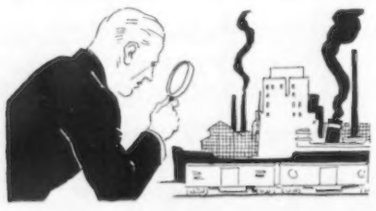
***See The Iron Age, Feb. 9, 1933, p. 225—Industry Must Recognize Law of Diminishing Returns.**

CULTIVATING new industries is one of the best ways to develop steel business. In fact the history of steel runs parallel with the rise of new industries.

The markets not only for steel but for any product are in a constant state of flux. The bonanza outlets of today are likely to be the declining outlets of tomorrow. The manufacturer who does not always keep searching for new markets will find his sales limited in proportion to the recession in his original markets.

To see just how this principle operates let us consider the history of a single company. The founder of this concern was a Connecticut farmer. His farm had little value for agricultural purposes. Its principal asset was a stream which cut it diagonally. The owner decided to dam the stream, but he did not know what to do with the power that he thus harnessed. He took a trip to New York City, hoping to find something that he could manufacture. In the big city he saw that hoopskirts were all the rage. He learned that these skirts were supported by a wire framework. He bought a few sample frames and began experimenting with their production when he got to his farm. He discovered that he could make them and, what was more important, that he could sell all he could produce.

This erstwhile farmer did a prosperous business for several years. Then the wheel of fashion turned and all that was left of the hoopskirt was its page in history. The manufacturer had to find something else to make or go back to farming. Fortunately about that time the all-metal clock was being developed in Connecticut. The developer asked the former framemaker to try his hand at fabricating clock springs. He did, and thus launched himself as a spring manufacturer. From that day to this, the record of the growth of the company he started is nothing more than a recital of the organization's entry into one spring-using industry after another. Since scores of industries use springs, the company's rise has kept pace with the expansion of the spring-buying industries.



During this period, the concern has sold springs to hundreds of industries. Many of these industries have entirely disappeared. Others have declined until their importance as a market is only a fraction of what it once was. Still others are comparatively new industries, whose value as markets for springs, is still in the ascendancy.

Success From Selling New Industries

This manufacturer owes his success, then, to his skill in selling to new industries. If he had been content to let well enough alone and to confine his selling to the industries from which he had been receiving business, the chances are he would have been out of the running long ago. His current markets would eventually have dropped out from under him. It was only by keeping his fences constantly repaired that he was able to maintain his business in a prosperous condition. Thus did he preserve his own company from market-obsolescence, but what is just as important, from our viewpoint at least, he provided an ever-widening outlet for steel. Every new industry that he added to his list of customers increased steel consumption just that much.

That, of course, is the scientific way to build a business. The successful manufacturer is always striking out for new markets. The producer that makes an industrial product does this by cultivating new industries. He knows that he will need these new outlets before long for some of the old ones are likely to dry up. He has learned from experience that the new markets of today will be the bread-and-butter markets of tomorrow. He realizes that the profitable markets of

the moment are likely to be the declining markets of the future.

The biggest markets for steel in recent years were the construction field, automobiles, cans, railroads, and the oil, gas and water industries. Most of these are comparatively new industries. One of the largest of them, the automotive, did not exist at all at the turn of the present century. The amazing rise of the canning business has taken place largely since 1900. The long-distance piping of oil and gas is another development of the last decade or two. If these industries had not come into existence or if steel people had not been quick to adapt their products to the needs of these flourishing infants, how different would have been the recent history of the steel business.

Every market that steel mills are today selling was at one time a new industry. A hundred years ago, at the beginning of the century being celebrated in Chicago this summer, the railroad business was brand new. At that time there were few who were imaginative enough to predict that one day it would be a larger user of iron than all the uses combined that existed in 1833.

As late as 1873, railroading was still a new industry, if we may be permitted to call it an "industry," for the sake of my present argument. The mileage that had been laid up to that time was insignificant. The country was in the midst of the worst depression that had harassed our economic life up to that time. A number of

Tomorrow's Steel Sale's Harvest

By JOHN ALLEN MURPHY
G. M. Basford Co.

capitalists got together and decided that we needed more railroads and longer railroads. A great rail boom started. It broke the depression of the 70's and gave the steel business the largest outlet it had yet known.

In Business Since 1742

From its inception in this country more than two hundred years ago, the iron business has progressed by constantly finding new places to sell. Fortunately there is one company in the steel trades whose own history comprehends almost the entire history of the steel industry. This is the Taylor-Wharton Iron and Steel Company, of High Bridge, N. J. This concern was founded in 1742, which makes it not only the oldest organization in the steel line but it is also the second oldest business enterprise on the North American Continent. It is antedated only by the Hudson Bay Company. By taking a bird's-eye view of Taylor-Wharton's history we can get a graphic idea of the part played by new industries in the rise of steel.

High Bridge was selected for the location of this business for two reasons. In the first place ore deposits were available locally, timber for charcoal was abundant and there was plenty of water power. The second reason, however, is more significant. At that time the manufacture of iron in the Colonies was forbidden by the English Government. High Bridge was an isolated spot in those days. Iron could be made there in comparative safety. The ban on iron making was lifted in 1753, but up to that time the Taylor organization was really operating a bootleg business.

During the first couple of decades, this pioneer concern made wagon tires, nails, crude farming implements, oxen yoke, and shoes for oxen, horses and mules. In fact until 1840, or during the first century of its existence, there was very little industrial development in this country. The iron made in this period consisted mostly of what was used in farming, logging, hunting, trapping, in the home and in warfare.

When the Revolutionary war broke out, cannons and cannon balls were manufactured for the Colonists at High Bridge. That was probably the first "new industry" market the young company founded. It is one market that has maintained itself, though irregularly, ever since, for Taylor-Wharton has made cannon balls or shells for every war the United States has been in.

The Revolutionary war contributed to the success of the concern in another respect. After the battle of Trenton, quite a number of the Hessian soldiers in the British army deserted. Many of them found work at the High Bridge iron works. These men were skilled iron workers, having been trained in the iron foundries in Hesse Cassel. Their thoroughness, experience and high craftsmanship did much to exalt the position of their employer in the industry.

The introduction of the steam railroad gave Taylor-Wharton another "new industry" market—the largest it had yet founded. The company's first railroad products were chiefly for the rolling stock, such as coupling links and pins, axles and wheels. It started with the chilled-iron wheel and later took on also the steel-tired wheel, specializing on what was known as the fused or welded wheel. This was a wheel with a steel tire and cast iron center, welded together so that the wheel was really solid and of one piece with no bolts or rings. Later this principle of one-piece construction was carried out in the development of the rolled steel wheel, which was solid throughout and which superseded the wheel of two materials.

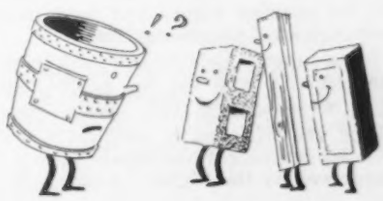
Impressed with its success in the railroad field, the concern began actively to look for new industries for which it could make steel products. In this way it discovered that mines were a promising outlet.

In 1892 the company began the manufacture of alloy steels. In this connection it soon learned a valuable lesson about marketing to new industries. It figured that it could greatly improve its railroad car wheels by making them of manganese steel. This plan proved a disappointment, however, as manganese was not a satisfactory material for this purpose. The same idea, with the thought constantly in mind of reaching out for new markets, was tried on street car wheels and mine car wheels. Again failure was met, except where the cars were given severe service, as in anthracite mining.

The concern was soon awarded, however, for its persistency in seeking new places to sell. The very material that would not do in car wheels, turned out to be more than suitable for the track work on which those wheels ran, particularly the frogs, switches and crossovers of both steam and electric railways. Thus did Taylor-Wharton enter the next stage of its development. And in this way, one by one, the company tackled industry after industry until it reached the wide diversity in its production which exists today.

All Big Buyers Were Once Little Ones

Of course, for a long time this method of winning markets by cultivating new industries has been practiced in the steel business, and in recent years quite extensively. Strange to say, however, this philosophy of market development is not so generally accepted as one would suppose. Too often all the selling emphasis is placed on getting tonnage business, with the result that new industries are frequently neglected. It is forgotten that the large tonnage buyers of the present



were once in new industries, and their orders were comparatively small. The heavy purchasers of a few years hence are likely to be today's unimportant small industries.

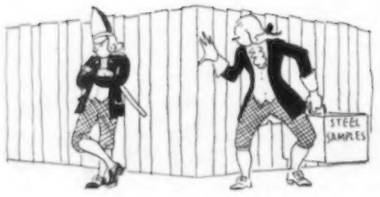
But even after the value of new industries as an outlet for steel is accepted, there is still much to be done before such business can be obtained. A mistake steel men make in going after new industry orders is in approaching these new prospects as they would approach old customers. The old customer knows the function of steel in the fabrication of his production. The new buyer, on the other hand, may not possess any such knowledge. He does not necessarily have any expert information about steel. In fact he may be convinced that other materials are better for his purpose. He may have used other materials in the experimental work in the creation of the product. He may have but little experience in actual production and not be familiar with the difficulties he will encounter in regular run-of-factory work. To sell this man steel, therefore, it is essential not only to show him how to use steel, but also to convince him why it is better for his needs than any other material.

To get business from a new industry much educational work has to be undertaken at the outset. For a year or two the selling campaign may consist entirely of educational effort. During this period ordinary salesmen should not call on the prospect. The missionary work at this stage of the drive should be in the hands of metallurgists, of production specialists, of engineers who are trained to help new businesses with their peculiar problems or "scientists in overalls," as one steel company calls them.

All elements in the prospect's market should be recognized in this campaign. Architects, designers, consulting engineers, technical advisers and any one else that has anything to do with the making of the product should be covered in the educational bally-hoo. Above all the owners of the new business should not be overlooked. In the last analysis it is they who will decide which material they can "afford" to use. Other things being nearly equal, the material that is the most thoroughly sold to all buying factors in the new industry, is the material that is most likely to be used.

One of the steel companies, three or four years ago, in cultivating a new industry, learned the importance of these various buying factors. It was trying to sell rustless steel to one of the large food industries. This industry was using big quantities of various metals and of other materials in its packing plants, but very little rustless steel was being used.

The superintendents and mechanical technicians, who did the actual buying, were sold on this special steel. They requisitioned it frequently, but for some reason their orders were not approved by the higher-up-executives.



Just what the objection was not even the plant superintendents could find out. An inquiry was conducted to unearth the source of the trouble. It was soon discovered that the Big Boys felt that the price of stainless had not yet stabilized and that any substantial investment in equipment made of it, would have to be written down drastically in a short time.

Of course it was easy to convince these executives that their fears were groundless. The point is, however, that up to that time the steel company had no contact with these executives. It was figured that they were too far removed from the actual buying of equipment to have any voice in determining what material should be purchased. When contact was established with them, and a selling message delivered to them systematically, the steel company began to get business.

Competition With Other Materials

In selling to new industries, it will usually be found that the competition of other materials is the chief obstacle that has to be overcome. For example, the building business, as far as steel is concerned, is a relatively new market. It took the structural steel fabricators several years to find out how to get their just proportion of the building market. A lot of orders that belonged to the steel trade were going to the cement folks. At one time it was figured that this outside competition was displacing close to a million tons of structural steel annually—that is of business that properly should have gone to steel. Cement has its place in building and an important place, too, but it was getting more than its share. The reason was the intelligent activity of the Portland Cement Association. The cement men were doing a better selling job than the steel men. That was all there was to it.

Once the American Institute of Steel Construction got busy, this situation began to change. The splendid selling campaign that the Institute waged for ten years furnishes us with an almost ideal program for marketing to new industries. Essentially the plan of operations that it followed is to get the story of structural steel to the 101 factors that influence or are likely to influence the selection of materials in any building job.

To get orders from new industries, it is necessary to keep continuously broadcasting an advertising message of some sort. This should be a general coverage appeal, reaching all industries that should be using metal. In this way, interest will be aroused occasionally in a new industry that could not be reached economically in any other way. Once the prospect has thus been isolated, it is a simple matter to concentrate the entire selling barrage on the prospect. If a steel mill digs up one worth-while new industry every two or three years, it will justify all the effort that may have been used to discover it.

Discusses Failures of Engine Exhaust Valves

FAILURES of exhaust valves of internal combustion engines were the subject of a paper contributed to the recent meeting of the (British) Iron and Steel Institute by C. C. Hodgson, Preston, England. Breakages are considered to be the result of corrosion-fatigue, the hot gases taking the place of the usual corroding media. There are also failures that are classed as burning and cracking, as at the edges of the valves; these are believed to be caused initially by small leakages of hot gases. The author's observations apply to all types of steel used for the purpose, including nickel-chromium and nickel-chromium-tungsten steels.

In the matter of burning, the author is of the opinion that trouble for which the steel has often been held responsible is due mainly to other causes. The best steels so far developed, he says, are incapable of meeting the demands, which are difficult to satisfy. To meet the requirements of an ideal valve, combining resistance of the seat to burning, high strength and scale resistance in the neck and the best wearing conditions from the stem and tip, would require, he suggests, a three-piece construction or two-piece construction and selective surface heardening. He adds that these methods would considerably increase the cost of a part already high priced, assuming that the manufacturing difficulties were overcome.

For rail ingots, where soaking pits are not available, bottom pouring in sets of five or six ingots is preferable to top pouring, according to an article by E. Spetzler, in *Stahl und Eisen* of June 1, on steel making and rolling at the Krupp-Rheinhausen works. The steel should be teemed at about 1390 deg. and the initial rolling temperature should be not less than 1160 deg.

HARRY J. WILLIAMS

Open-Hearth Furnaces with Natural Gas Firing

By H. J. WILLIAMS
Industrial Gas Engineer
Equitable Gas Co., Pittsburgh

DURING the past few years, the natural gas industry has developed many new gas fields which have greatly increased the available supply of natural gas. At the same time, the expansion of distribution facilities is making natural gas available to an ever increasing number of steel plants for industrial purposes. In fact, natural gas is now available in such quantities that it can be used as a fuel in the open-hearth furnace with the assurance that a sufficient supply is available.

Natural gas has been used as an open-hearth fuel in the Pittsburgh district for many years. Consequently, its application is not an uncertain experiment, for experience has shown that it is an ideal open-hearth fuel. In fact, natural gas has many desirable features that cannot be secured with any other open-hearth fuel. The advantages cover all phases of open-hearth work, for example:

1. Construction costs can be reduced.
2. Maintenance costs can be reduced.
3. Combustion can be improved.
4. Quality of steel can be improved.

Each of these above advantages will be discussed in this article, while subsequent articles will take up the feature of open-hearth construction and design that must be given attention if all the advantages of natural gas firing are to be secured.

Reduced Construction Costs

In the construction of an open-hearth plant, there are many parts that can be eliminated and other parts that can be simplified, if the plant is designed for the use of natural gas as the fuel. This simplified construction naturally results in reducing the cost of the installation.

First, consider the furnace alone. The port construction is simplified when the furnace is designed for natural gas. The best design of port for natural gas firing consists of a single port and single uptake, with the gas entrained through the sides of the port. While, on the other hand, the usual design for producer gas or mixed blast furnace and coke oven gas firing, is a three-uptake design with a water cooled gas port set inside the air port. The usual arrangement for oil or tar is also three uptakes. A furnace designed for natural gas requires only one regenerator on each end of the furnace, while all regenerated fuels require two regenerators on each end of the furnace, and a much more intricate reversing valve arrangement. All of these items tend to reduce the construction costs when natural gas is to be used as the fuel.

Now, consider the auxiliary equipment. It is in the elimination of the auxiliary equipment required to handle other fuels that the greatest saving is made. If natural gas is to be used as the fuel, it is only necessary to lay a gas line from the furnaces to the meter house. But if other fuels are used, the auxiliary equipment required to handle the fuel often costs as much as the furnaces. For example, if oil or tar is used as the fuel, it is necessary to install storage tanks, pumps, insulated pipe lines for oil and steam, heating coils, strainers, a steam boiler plant, and atomizing burners utilizing steam or compressed air for atomization. If producer gas is used as the fuel, it is necessary to install a complete gas producer plant including coal storage bins, coal handling equipment, gas producers, steam boiler plant, ash removal equipment, pipe lines, etc. Consequently, the cost of building an open-hearth plant for natural gas is much less than for other fuels.

Reduced Maintenance Costs

The large item in the maintenance of an open-hearth furnace is, of course, the brickwork. The number of heats per campaign, when repairs were made, and other information regarding maintenance of brickwork on

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NOW that natural gas has been made available to many steel-making centers, thanks to the great systems of pipe lines that have been built to distribute from the oil fields, a special study of natural gas fired open-hearth practice is timely. The present article makes a strong case for the natural gas application and will be followed by four others, particularizing on design and operating matters, such as the gas ports, regenerators, combustion control and furnace insulation.

The author, Harry J. Williams, has been with the Equitable Gas Co., Pittsburgh, as industrial gas engineer since 1931, specializing on steel mill applications of natural gas. After graduating from the Carnegie Institute of Technology, and prior to his present connection, he served in the open-hearth department and later as assistant plant engineer with the American Steel Foundries.

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several natural gas-fired furnaces, is as follows:

10-ton acid furnace, 10-to-12-ton heats

900 heats to the furnace campaign, usually no repairs to roof, back wall, or ports during entire campaign. Front wall is repaired about every 250 heats. Checkers are not touched throughout the entire campaign.

30-ton basic furnace

About 300 heats to the campaign using natural gas as the fuel, and 260 heats to the campaign on the same furnace using fuel oil. Usually no repairs to roof or ports on natural gas, while the ports required repairing every 40 or 50 heats, when the furnace was on oil.

35-ton acid furnace, 40-to-60-ton heats

700 heats to the campaign with only minor repairs to the ports, front wall, and roof.

75-ton basic furnace

300 heats to the campaign. Repair front wall and port ends after about 150 heats. No repairs are required on the other parts of the furnace during the entire campaign.

The long furnace campaigns and low maintenance costs on the above furnaces prove that the cost of maintaining the brickwork on a natural gas-fired furnace is lower than it is on furnaces fired by other fuels.

Another feature of natural gas that reduces maintenance costs is its freedom from dust and dirt. The regenerators on none of the above furnaces were cleaned out or blown down throughout the entire furnace campaigns, while the checkers on furnaces using other fuels, such as producer gas, are cleaned out by blowing down the dust every week-end.

The fact that natural gas requires no auxiliary equipment for storage or handling the fuel also greatly reduces the maintenance costs, because the maintenance on complete fuel oil installations, gas producers, and steam plants, is quite extensive.

Improved Combustion

Experience has shown that a very satisfactory open-hearth flame can be produced from natural gas and preheated air alone. The proper port design for natural gas firing produces a slow mixing of the gas and air, which results in a long, highly luminous flame. The luminosity of the flame is produced by the free carbon heated to incandescence in the flame, out of contact with the air. The free carbon results from cracking part of the gas. The principal constituents of natural gas are methane (CH_4), and ethane (C_2H_6). The cracking reactions are as follows:

$$CH_4 + \text{Heat} \rightarrow C\ 2H_2$$
$$C_2H_6 + \text{Heat} \rightarrow 2C\ 3H_2$$

Thus, a highly luminous open-hearth flame is produced by burning natural gas alone, and with this type of flame a natural gas-fired furnace produces heats as fast as any other fuel.

The speed at which a furnace will turn out heats, using a certain fuel, is a very important factor regarding the choice of fuel. In fact, cutting down the time of heats is one of the ways of effecting the greatest reduction in the cost of producing steel. An idea of the average time of heats for a few natural gas-fired furnaces, is as follows:

		Charge to Tap. Hr.
1.	15-ton heats, acid...	4½ to 5
2.	30-ton heats, basic..	5 to 5½
3.	40 to 50-ton heats, acid	7
4.	75-ton heats, basic..	8

(45 per cent pig iron in charge)

All of the above furnaces were charged with scrap and cold pig iron. The above figures are not suggested as the ultimate that can be accomplished with natural gas firing, but merely as every-day results on a group of furnaces. Most open-hearth men will agree that the above figures represent good time for turning out heats and this material is submitted to refute the erroneous impression held by many open-hearth men that natural gas is not a fast fuel.

Another desirable feature of natural gas as an open-hearth fuel is its constant composition and high calorific value. This constant composition insures uniformity of operation and quality. A tpical analysis of Pittsburgh natural gas is as follows:

Analysis of Pittsburgh Natural Gas

Methane, per cent.....	80.7
Ethane, per cent.....	18.8
Nitrogen, per cent.....	0.5
Carbon Dioxide.....	None
Oxygen	None
Specific gravity.....	0.65

Gross heating value per cu. ft. at 60 deg. F. and 29.92 in. mercury, B.t.u.....	1147
Net heating value per cu. ft. at 60 deg. F. and 29.92 in. mercury, B.t.u.....	1047

Finally, one of the most desirable features of natural gas as a fuel for the open-hearth is its adaptability to combustion control. There is a distinct trend at the present time toward the installation of combustion control on the open-hearth furnace. Combustion control, along with other improvements, involves proportioning the fuel and air by flow measurements. The flow of natural gas can be accurately and easily measured by installing an orifice meter in the line. However, this is not true with other open-hearth fuels. Producer gas cannot be measured directly because of the tar, soot and dust that accompany the gas. Fuel oil and tar cannot be accurately measured because the pressure drop across an orifice varies with the temperature and viscosity of the fuel as well as with the rate of flow. If mixed fuels are used, such as blast furnace gas an tar, or coke oven gas and oil, the proportioning of fuel and air is still more difficult and uncertain. Consequently, natural gas is the only open-hearth fuel that is adaptable to accurate combustion control.

Improved Quality of Steel

A very important feature of natural gas as an open-hearth fuel is its absolute freedom from sulphur. The removal of sulphur from the bath of steel in the basic furnace is very uncertain, and in the acid furnace, impossible. It follows, that the only way to keep the sulphur content of steel within the specified limit is to have the sulphur content of the charge below that limit, and use a fuel free of sulphur. It is a well-known fact that fuels carrying compounds of sulphur may be responsible for a portion of the sulphur content of steel. The sulphur content of fuel oil varies from 0.4 to 1.2 per cent while coal tar contains 0.75 per cent sulphur. Producer gas and coke oven gas contain sulphur in varying amounts. In fact, these fuels may add as much as 0.015 per cent to the sulphur content of steel. Blast furnace gas also contains a trace of sulphur. The amount of sulphur present in these fuels depends on the sulphur content of the coal. Thus, natural gas is the only open-hearth fuel that does not increase the sulphur content of the steel, since as stated above, it is the only open-hearth fuel absolutely free of sulphur.

Another advantage of natural gas as an open-hearth fuel is the reduced amount of final additions that are necessary to finish a heat of steel. This fact has been proved by the experience of open-hearth men on the operation of furnaces converted from fuel oil to natural gas. A few of the materials referred to above as final additions are ferromanganese, ferrosilicon, ferrochromium, and ferrovanadium. When

ferromanganese is added in the furnace there is about a 50 per cent loss due to the oxidizing action of the slag. When this material is added in the ladle, the loss is 10 to 15 per cent. Ferrosilicon is always added in the ladle in making basic steel, with a loss of 30 to 35 per cent. In making acid steel, ferrosilicon may be added in the furnace as well as in the ladle. Ferrochromium is always added in the furnace; the loss is about 20 per cent. Ferrovanadium is always added in the ladle; the loss is about 10 per cent.

The above losses, due to the oxidizing action of the slag, are less on furnaces fired by natural gas than they are on furnaces fired by other fuels, provided the initial slag producing materials are the same. The reduction in loss of final additions that can be effected by changing to natural gas firing, depends on present operating conditions, but should range from 10 to 25 per cent.

A sharp oxidizing flame, characteristic of oil, tar and mixed fuels, will cause the slag to be more oxidizing, while a soft, luminous natural gas flame will tend to have a reducing effect on the slag. The less oxidizing the slag at the time of tapping, the less will be the loss in the final additions.

Natural gas has several other features that help maintain a high quality of product. They are the tendency of a natural gas flame to prevent the over-heating and over-oxidation of steel. These features are very important in the manufacture of all grades of steel, whether they be alloy, high carbon, or low carbon heats. However, these advantages of natural gas are particularly important in the production of low carbon "rimmed" heats.

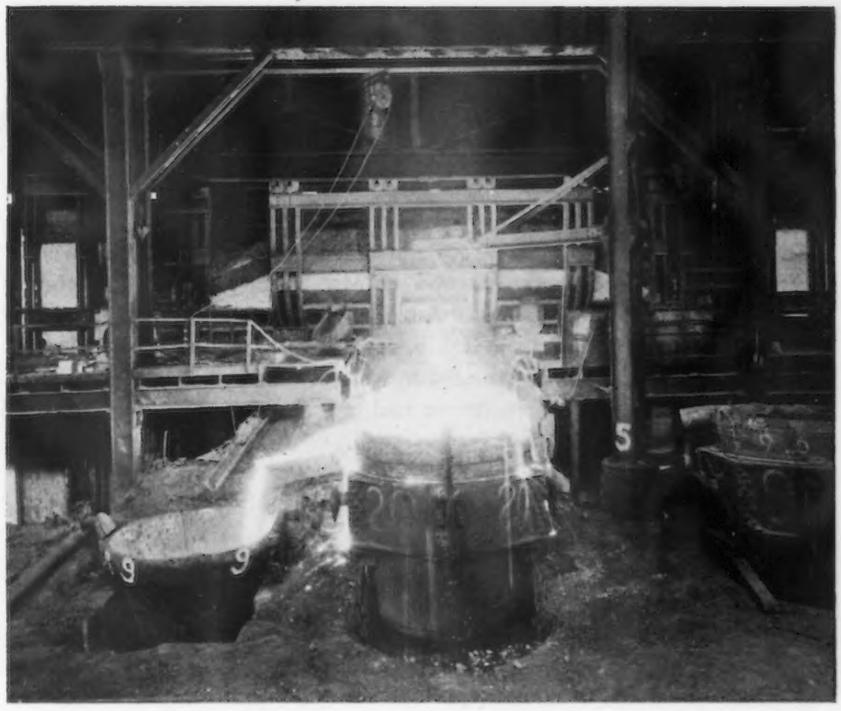
There has been a decided trend among steel plants during recent years, toward the production of rimmed instead of killed heats. This is due to the following advantages of rimmed steel:

1. Produces a better finish on all types of hot or cold rolled materials.
2. Requires less deoxidizers.
3. Contains a minimum of non-metallic inclusions in the outer case of the ingot.

There are two factors responsible for most of the defective rimmed steel produced that must receive careful attention. They are:

1. Too high a pouring temperature.
2. Over-oxidized steel.

If the pouring temperature is too high, the rimming action will be slow, the ingot will "grow" in the mould and the gas holes will be too close to the surface, producing a thin-skinned ingot. Therefore, it is important that rimmed steel be poured at the right temperature. The danger of over-heating steel is minimized when natural gas is used as the fuel, because the temperature is much more accurately controlled than is possible with other fuels.



A 75-ton basic natural-gas fired open-hearth furnace at the time of the tapping of the heat

Over-oxidized steel is caused by too much iron oxide, FeO, in solution in the steel. Of course, all rimmed steel must have a certain amount of FeO in solution in order to produce the rimming action. The FeO content in the teemed steel depends on the residual FeO content of the steel in the furnace and the amount of deoxidizer added in the ladle. The ladle additions can be controlled but the residual FeO content of the steel in the bath varies from heat to heat. However, when natural gas is used as the fuel, the FeO content of the bath can be controlled more closely than when other fuels are used, because the best natural gas-fired open-hearth flame is not a sharp oxidizing flame but rather a highly luminous neutral flame. For this reason steel produceed in a natural gas-fired furnace is not as likely to become over-oxidized as steel produced by other fuels.

Since a natural gas flame helps to prevent over-heating and over-oxidization, which are the two troublesome factors in the production of rimmed steel, it follows that natural gas should be an ideal fuel for the open-hearth producing rimmed steel. Actual practice has shown this to be the case, for a large steel plant in the Pittsburgh district, using natural gas as its open-hearth fuel, has been very successful in the production of rimmed steel and seemingly has had less difficulty than plants using other fuels.

A summary of the advantages of natural gas, as a fuel for the open-hearth furnace, is as follows:

1. **Reduced construction costs**
   - Simplified furnace construction.
   - Elimination of auxiliary fuel handling and fuel storage equipment.
2. **Reduced maintenance costs**
   - Longer furnace campaign.
   - Longer life of brickwork.
   - Freedom from dust in fuel.
   - No auxiliary equipment.
3. **Improved combustion**
   - Luminous flame.
   - Fast working furnace.
   - Constant composition.
   - High calorific value.
   - Adaptable to accurate combustion control.
   - Low fuel consumption.
4. **Improved quality of steel**
   - Absolute freedom from sulphur in fuel.
   - Reduced weight of final additions.
   - Reduced tendency to over-heat steel.
   - Reduced tendency to over-oxidize steel.

An open-hearth furnace can be changed from other fuels to natural gas very easily and at slight expense. However, there are some features of open-hearth design that are peculiar to natural gas firing, and in order to secure the best furnace results, such as lowest fuel consumption and shortest time of heats, it is essential that these features be given careful consideration. They are as follows: 1. Ports; 2. Regenerative chambers; 3. Combustion control equipment; 4. Insulation.

The first of these features will be discussed in the following article of this series.

Welded Steel Used for Diesel E

CONSTRUCTION of the crankcase and other parts of a 1000-hp. twin-six engine is outlined in this section of Mr. Chapman's paper, continued from page 27 of THE IRON AGE of Aug. 24. This welded crankcase, built of alloy steel, has a weight of about 2.6 lb. per hp., and the entire engine weighs less than 10 lb. per hp., running on the test block. Calculated from the indicator card, each weld in this structure is said to be subjected to an impact load of 38,000 lb., occurring 12 times each second.

Another application of welded-steel construction is the crankcase of a 10 cylinder, 600-hp. radial aircraft engine, this crankcase weighing less than 1 lb. per hp.

THE two Diesels pictured in Fig. 7 have a crankcase of the same general type as those shown in Figs. 5 and 6 [page 29 of the Aug. 24 issue], except that the engine is two cycle and slight modifications were made in the case to take care of this feature. These engines form part of the exhibit of the Winton Engine Corpn., Cleveland, at the Century of Progress Exposition in Chicago, and have been in continuous operation since the opening of the fair, supplying power and light to the entire General Motors Building there. This installation, including generator and sub-base, has a specific weight ratio of 39 lb. per hp. The specific weight ratio of the engine itself is 20 lb. per hp.

To eliminate still more weight in steel crankcases, the construction of a case in which the gas and inertia loads were carried entirely by the welded structure was initiated. With the tie-rod type construction, much material is not working effectively, especially if the tie rods are not set properly. In a completely welded unit, better distribution of the stresses can be achieved because of the monolithic construction. An experimental single-cylinder frame was built, embodying a main frame flame-cut from a plate of steel 2-in. thick. This model was subjected to strain gage tests to determine the efficacy of the conception. Fig. 8 shows the main frame as cut out for the model test engine, and Fig. 9 shows the built-up single cylinder unit. The main frame was joined by welding to the top deck, into which the cylinder head studs were tapped. This frame showed satisfactory deflection and stress characteristics.

An effective method of determining points of maximum stress in a three dimensional structure is to paint it with a varnish having a low modulus of elasticity and a low yield point. When a static load is applied to the structure, the varnish cracks at the point of maximum stress while the structure is only lightly loaded. The varnish method shows points of maximum stress with a single application of a load, and the load at which the varnish cracks correlates a wealth of information about stress factors and fatigue performance. It is needless to say that the varnish will first crack at those points where experience dictates a large radius. It will crack at the contours of an improper weld. It will crack at the root of an undercut.

Construct 1000-Hp. Twin-Six Engine

Based upon this experiment, construction was undertaken of a 1000-hp. twin-six engine, in which the entire gas load was carried by the welds. Fig. 10 shows the type of flame-cut main frame which was used. This frame transmits the gas load of one bank of cylinders past the gas load of the other bank of cylinders, and into the main bearings. The minimum weight design is one in which the material is loaded in straight tension. The flexibility of flame-cut steel plate in meeting this ideal condition is well illustrated by the frame member of Fig. 10. The stub ends of the frame could not be run through to the top deck because the stagger of the connecting rods produced a 3-in. offset in each cylinder with respect to the cylinder in the other bank, which necessitated the use of a transition joint.

Since the transition joint had a peculiar shape, more experimental work was done to determine an efficient design for the joint before proceeding with the engine. Fig. 11 shows the result of a tensile test of the experimental joint. The stubs were inserted in the notched plate and welded strictly in accordance with the photoelastic studies. The experimental joint simulated the condition in the engine where the joint carries an impact load of 19,000 lb. The joint shown fractured outside the weld, through the plate, at a load of 212,-

Fig. 8—Main frame section as cut out for model test engine.

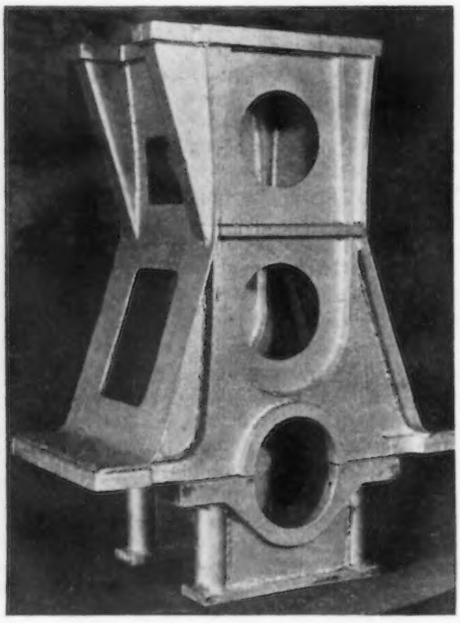


Fig. 9—Built-up single-cylinder unit of model test engine.

sel Engine Structures

By EVERETT CHAPMAN
Vice-president, Lukenweld, Inc.,
Division of Lukens Steel Co.,
Coatesville, Pa.

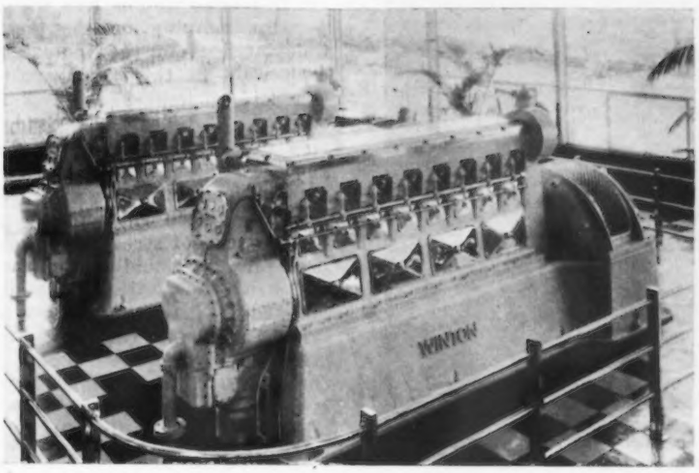


Fig. 7—These Diesels, of welded steel construction, have supplied power and light for the entire General Motors Buildings since the opening of the Century of Progress Exposition. They form part of the exhibit of the Winton Engine Corpn.

000 lb. Tensile tests of such joints in conjunction with a coat of brittle varnish are very instructive.

Welded Joints Radiographed

Fig. 12 shows the crankcase partly finished. The top deck was welded to the transition plate with a single butt weld running the entire length of the engine on each side. The gas load of each cylinder is then carried through the butt weld at the top deck, and through the two transition joints to the main bearings. In the condition shown in Fig. 12, each weld, including the transition joints, was radiographed by means of radium to discover any imperfections, unfused joints or porosity that might have existed. The crankcase was also thoroughly inspected for undercuts and surface discontinuities. In the construction of two of these crankcases, it was not necessary to chip and reweld any of the joints.

Fig. 13 shows a further stage in the progress of the crankcase. The inner deck which carries the lower end of the cylinder liner is in place. The side plates and stiffening ribs have

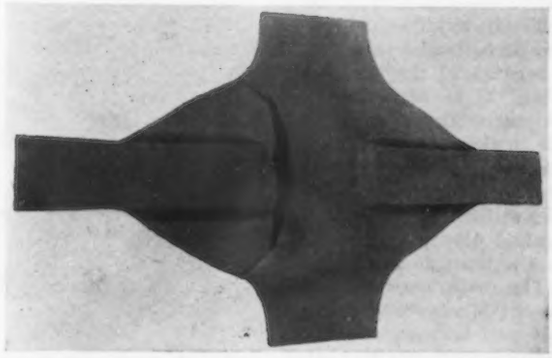


Fig. 11—Result of tensile test of experimental joint made to simulate the condition in the engine where the joint carries an impact load of 19,000 lb. The joint fractured outside the weld, as shown, at a load of 212,000 lb.

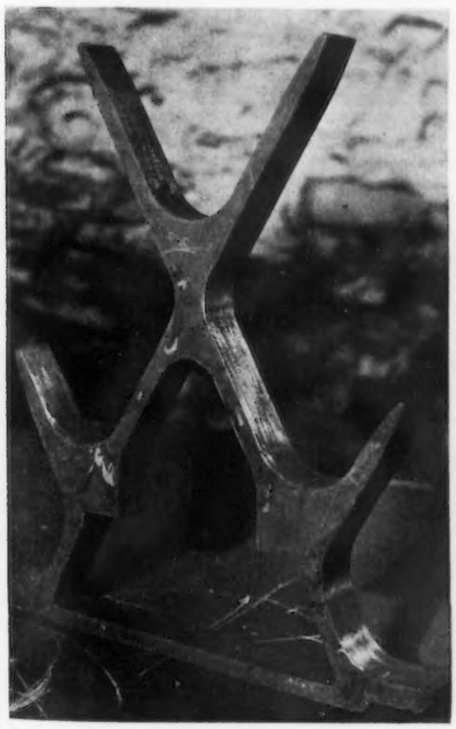


Fig. 10—Type of flame-cut main frame used in construction of 1000-hp. twin-six engine.

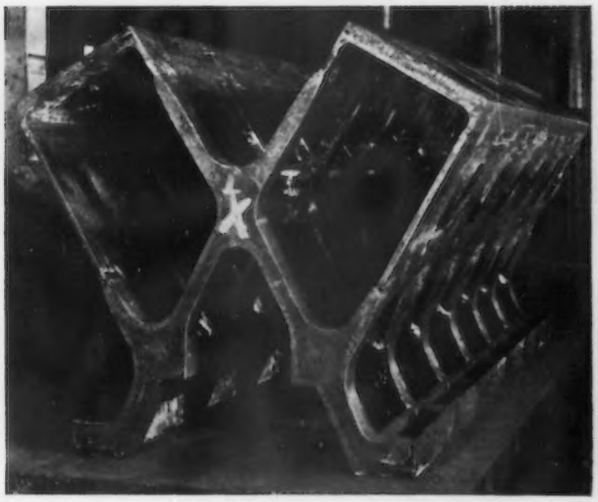


Fig. 12—Diesel crankcase partly finished. In this condition each weld, including the transition joints were radiographed to discover unfused joints, porosity or other imperfections.

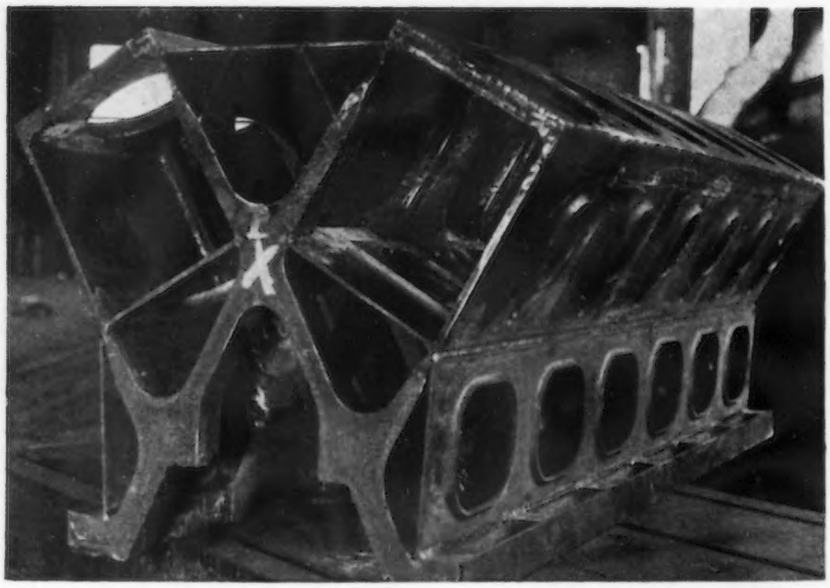


Fig. 13—Further stage in progress of the crankcase. The inner deck is in place and the side plates and stiffening ribs have been added.

been added. The hand holes providing access to the connecting rod caps and the hand holes for inspecting the piston rings have been flanged in the side plate itself. In welded steel construction, there is a tendency to use thin sections because of the strength of the material. It is necessary to guard against unsupported areas of any magnitude in thin material when the mechanism is one which may set such areas in resonant vibration. The flued hand holes stiffen the thin plates admirably against this phenomenon. Fig. 14 shows the main bearing caps and oil pan. The main bearing girders are flame-cut from 4-in. steel plate. The oil pan was constructed as shown to provide a tie for the bottom legs of the main frame members.

Fig. 15 shows the completed crankcase as it left the weld shop; in this view the crankcase is mounted on the oil pan to illustrate the manner in which the oil pan forms the bottom tie for the complete case. Built in the high strength, welding quality alloy steel, this crankcase has a weight of about 2.6 lb. per hp. The entire engine weighs less than 10 lb. per hp. running on the test block. Calculated from the indicator card, each weld in this structure is subjected to an impact load of 38,000 lb. occurring 12 times each second. Referring to Fig. 1 [page 28 of the Aug. 24 issue] the recently completed 300-hr. full-load run indicates that the frame has been subjected to a number of cycles of stress far beyond that necessary to establish the fact that the stress concentrations which undoubtedly exist in the frame are not large enough to raise the average stress above the endurance limit for the alloy steel from which the frame is made.

The performance of this welded steel crankcase offers conclusive proof

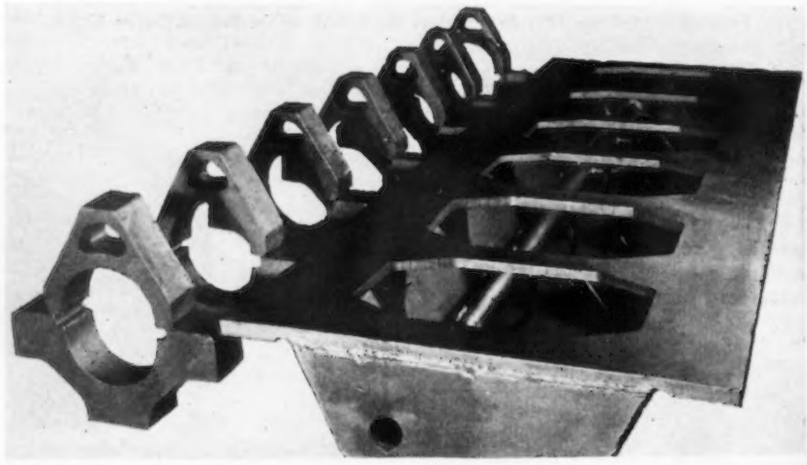


Fig. 14—Main bearing caps and oil pan. The main bearing girders are flame-cut from 4-in. steel plate.

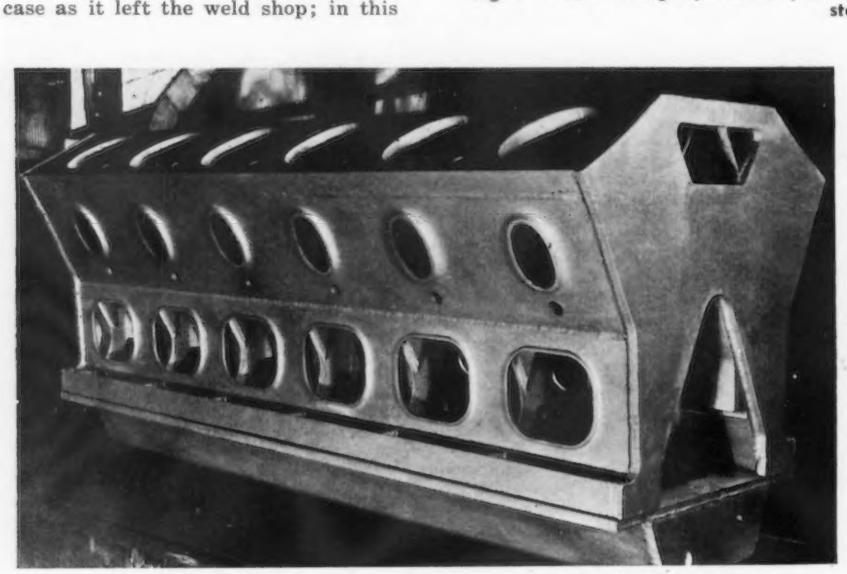


Fig. 15—Completed Diesel crankcase as it left the weld shop. It is mounted on the oil pan to show the manner in which the pan forms the bottom tie for the complete case.

that welded joints can be designed and constructed commercially to handle, at a high stress, the most severe type of load encountered in modern mechanical practice—that of repeated impact.

Welded Crankcase for 600-hp. Radial Engine

Another application of welded steel construction to Diesel crankcases is shown in Fig. 16. It is a crankcase for a 10-cylinder 600-hp. radial engine, and is constructed of welded steel, using as the base metal the same high-strength alloy steel employed in the twin-six engine. All-weld metal specimens deposited with the alloy electrode used to fabricate this case and the twin-six case have a yield point of 65,000 lb. per sq. in., an ultimate strength of 95,000 lb. per sq. in., and an elongation of 24 per

DIESELS of welded-steel construction have been in operation in marine service for two years, and in stationary service since the opening of the Century of Progress Exposition in Chicago. In the railroad field, the 110-mile an hour streamlined passenger train of the Union Pacific will be powered by a welded steel engine, and also the high-speed train being built for the Chicago, Burlington and Quincy.

cent in 2 in. Here again the main loads are carried by a weld and it is only necessary to pay strict attention to all the design details to insure that such a case will exhibit satisfactory performance.

Steel castings were used to form the periphery of the cam pocket. The contours around the push-rod guide bushing and the bolts tying the two halves of the engine together were sufficiently intricate to dictate the use of a steel casting. The parts were cast in units of one per cylinder and the entire casting assembly welded into one ring, which was inspected and machined before welding it into the rest of the assembly. In an application such as this, it is essential that the carbon content of steel castings be maintained below 0.20 per cent and that the castings be of the finest grade obtainable. For use in welded steel assemblies, electric furnace castings are highly desirable because of the close control over both pouring temperature and analysis. The small amount of dissolved gases present offers favorable welding characteristics.

The weight of the radial engine crankcase is less than 1 lb. per hp.

Welded steel crankcases of the types discussed enable the engine builder to offer the user of mobile prime movers a light-weight, highly efficient and powerful unit, embodying all the advantages of the Diesel principle. The Winton Engine Corpn., Cleveland, with which it has been a privilege to work in this development, can offer today an engine-generator unit supplying 750 kw. of electrical energy which, including all auxiliaries, will weigh 30 lb. per hp. Railroad vision has enabled immediate application of this notable prime mover to main line service. Under construction today is a welded steel engine structure which will be used in the power unit of the Union Pacific System's 110-mile per hour high-speed passenger train. The Chicago, Burlington & Quincy's high-speed passenger train will have, as its motive power, a 600-hp. Diesel engine of welded steel.

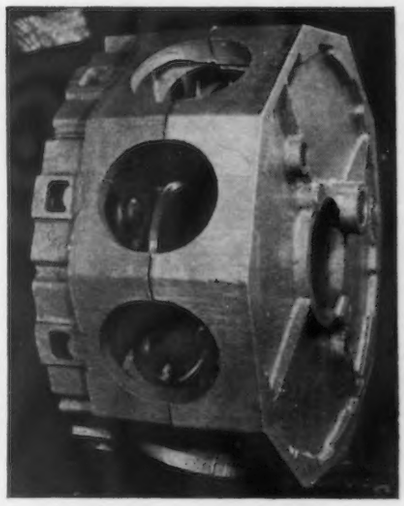


Fig. 16—Welded steel crankcase for a 10-cylinder 600-hp. radial engine. Steel castings were used to form the periphery of the cam pocket.

Some progressive railroad undoubtedly will take the next step and employ two or three of these units on a single chassis for main line freight movement at an economy never before approached.

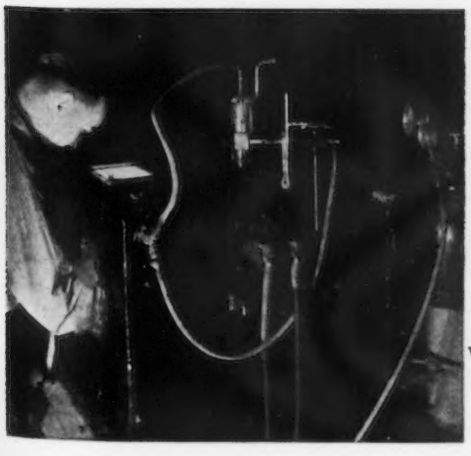
Westinghouse Laboratories Study Gas Absorption During Welding

BECAUSE the amount of gas absorption during welding has a vital effect upon the finished weld, the Research Laboratories of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has constructed the special welding hood illustrated, in which the atmosphere may be controlled for the study of gas absorption. In this hood weld pads can be prepared under any atmosphere. The chemical and gas analysis of the deposited metal gives an indication of the interaction between gases and metals.

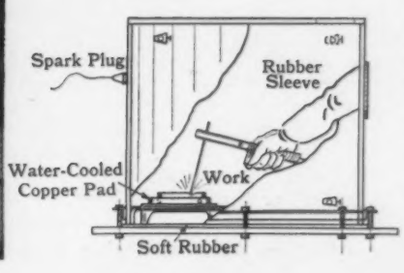
At welding temperatures the solubility of metals for gases is generally increased. After the metal cools, some of the previously dissolved gases are given off and cause blow-holes. Other gases are not liberated, but remain in solution; these affect considerably the properties of the weld material.

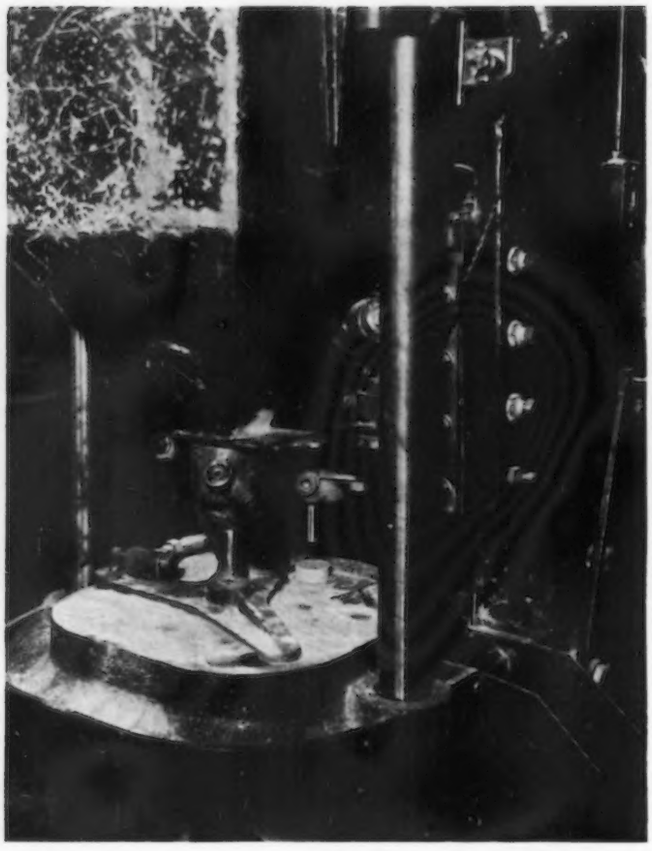
It is stated that with high-grade coated electrodes the oxygen content near the arc is very low but the nitrogen content is over 90 per cent. However, the nitrogen absorption of the deposited metal is smaller with the higher nitrogen contents in the atmosphere. With the use of the welding hood this strange phenomenon of lower nitrogen absorption in an atmosphere of 98 per cent nitrogen as compared with the nitrogen absorption in air is said to have been confirmed. This result is emphasized as important to the welding industry because it discloses some of the mechanism of absorption by weld metal. It shows, it is stated, that molecular nitrogen is hardly dissociated at iron-arc temperatures. It must be assumed, therefore, that nitrogen is absorbed by the weld metal in the form of an active nitrogen-oxygen compound.

Single gases or mixtures of gases can be admitted to the hood. If gases are employed which might give an explosive mixture, a spark-plug test is made in the gas mixture before starting to weld. If the pressure inside the hood is increased too much as a result of the heat developed by the arc, the flow of gas can be increased. The hood is connected to a vacuum pump to retain pressure.



ARRANGEMENT of the special welding hood for studying gas absorption during welding as shown in view below, preparation of a weld specimen is pictured in view at left.





SPECIAL machines are used to process powdered raw material into pills. The powder is poured by an operator into a hopper, which feeds it into an oscillating shoe. The shoe passes over the opening of the lower die, filling the cavity with powder. The shoe then moves out of place and the top punch compresses the powder to the necessary hardness.

From Powder to Pills to Plastic Products

By BURNHAM FINNEY
Detroit Editor, The Iron Age

NOW in its adolescent period, the molded plastics industry has suffered relatively little from the depression. It is at that stage in its growth where new applications are being discovered almost daily and where its markets are expanding at a rapid rate.

The reason for this sturdy growth is the uncommon attributes which plastic molded products possess. They have a smooth, lustrous and permanent finish not affected by organic solvents or by hot or cold liquids. They are shatter-proof and chip-proof, light in weight and do not readily conduct heat. Their mechanical and dielectric strength is high. The molding process itself is relatively simple, requiring little skill on the part of press operators. Metal studs and inserts are imbedded in one molding operation.

Few companies have had longer and more extensive experience in the manufacture of molded plastic products than the Reynolds Spring Co., Jackson, Mich., which went into this business in 1920, making radio parts. It soon branched out into custom molding work, producing mainly automotive and additional radio parts. The company's molding division has had a steady growth, its equipment having been expanded through the years from an original battery of eight 35-ton presses to 70-odd presses ranging in capacity from 35 to 400 tons. Just in the past year manufacturing facilities have been greatly enlarged. Today the molding division is making electrical devices, builders' hardware (such as door knobs, door trim, etc.), radio and automotive parts, household utilities, and gift ware (marketed under the name Bonnyware).

Raw materials at the molding division are received in powdered or granular form. To facilitate handling at the mold and to establish a predetermined weight per unit, they are processed into so-called pills or biscuits. For this purpose special machines are used. The powder is poured by an operator into a hopper, which feeds it into an oscillating shoe. This shoe passes over the opening of the lower die, which has been mechanically dropped to a stated depth, filling the cavity with powder. The shoe then moves out of place and the top punch compresses the powder to the necessary hardness. The bottom die raises up to the level of the table and the shoe again passes over the top of the cavity, kicking the pill into a receptacle and at the same time filling the cavity where the bottom die has gone on to its next cycle.

Pressures for compressing the powder into pills vary from 5 to 80 tons, according to the size desired. The amount of pressure can be regulated for the proper hardness by adjustments on the ram of the press. Pills are made in many sizes, ranging in diameter from ⅛ in. to 4 in. and in thickness from ⅛ in. to 1½ in. In volume they are approximately one and a half times that of the finished molded product. There are no set rules for determining the hardness required of pills, this being arrived at by the trial-and-error method according to the requirements for a particular mold or group of molds. Pills do not necessarily follow exactly the shape of the mold. Two men operate a battery of pre-form presses at the Reynolds plant.

Hydraulic presses in which plastic material is molded into final shape are of the four-strain-post type. Molds are clamped rigidly in place in the presses and do not have to be handled by the operator. They are fitted with mechanical top and bottom ejectors and are operated on a low pressure steam line of 300 lb. per sq. in. which is used to close the press rapidly when the work is in place. The final forcing action is applied by means of a high pressure line of 2700 lb. per sq. in. All presses are equipped with automatic control valves whereby any

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FEW companies have had longer and more extensive experience in the manufacture of molded plastic products than the Reynolds Spring Co., Jackson, Mich., the operating practices of which are herewith described. The processing of raw materials into pills, the molding work itself and the type of molds used are outlined. Many of the steel molds are made by the hobbing process.

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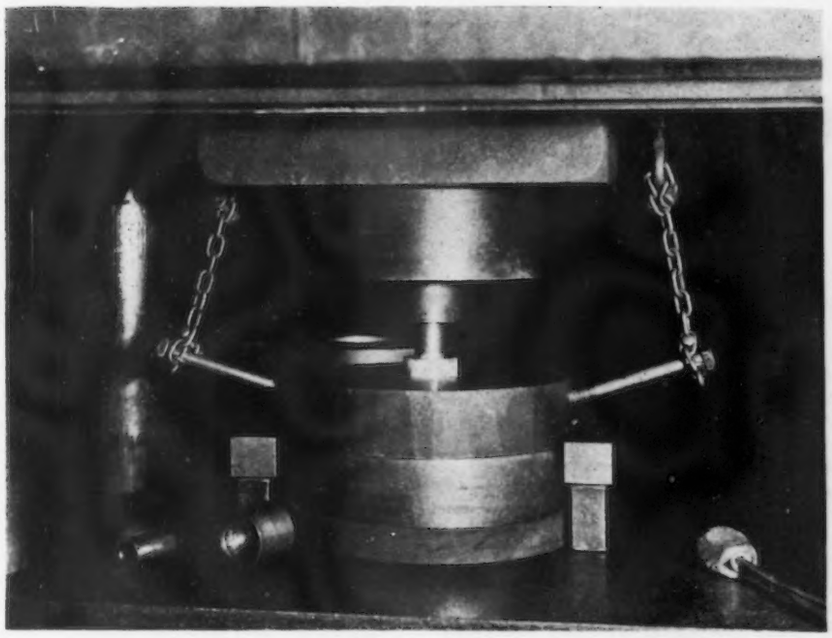
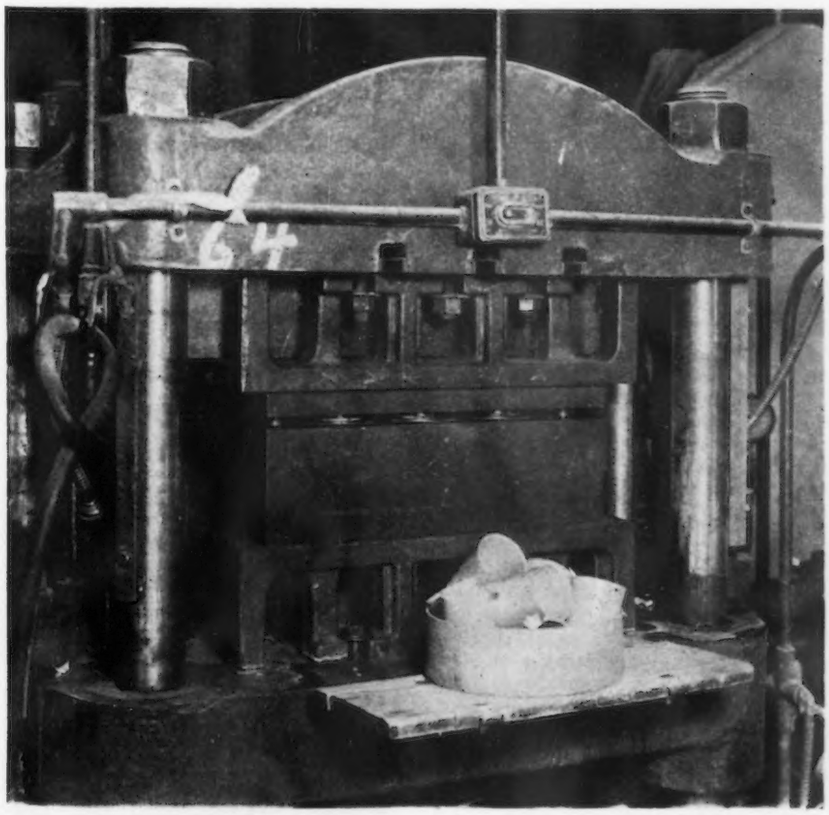


Many steel molds are made by the hobbing process, consisting of the formation in a hydraulic press of duplicate dies by means of a hardened steel hob or punch. The press has upper and lower anvils hard enough to resist the impression of the hobbing tool and the piece being hobbed.

definite molding cycle can be maintained from the closing of the press to the opening and ejection of the molded part. The average molding time is 3½ min.

Presses are fitted with hardened steel molds containing individual units which vary in number according to the amount of production required and the tonnage capacity of the press. Molds which are hobbed in the tool room are made from mild, low-carbon, carburized steel, but other molds are manufactured from oil-hardened tool steel. All molds are highly polished on hand buffing machines to give a lustrous finish to the molded product. For protection against corrosion and to provide an unusually fine and lasting finish, molds sometimes are chromium plated. Molds do not have to be specially hard; they are put through a hardening process principally to give them a high degree of toughness. The actual hardness is 49 to 53 on the Rockwell C scale. All molds are built in the company's tool room and are hardened in its heat-treating department. They are exceptionally long-lived.



Plastic material is molded into final shape in hydraulic presses of the four-strain-post type. All presses are equipped with automatic control valves whereby any definite molding cycle can be maintained from the closing of the press to the opening and mechanical ejection of the molded part.

Many steel molds are made by the hobbing process, which consists of the forming in a hydraulic press of duplicate dies or cavities in the steel by means of a hardened steel hob or punch. Any type of hydraulic press fitted with hardened steel anvils and having sufficient power can be used for hobbing, the pressure required ranging from 50 to 200 tons per sq. in. The press is equipped with upper and lower anvils sufficiently hard to resist the impression of the hobbing tool and the piece being hobbed.

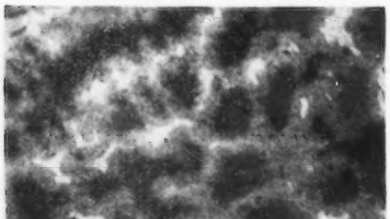
The hob is a duplicate in hardened tool steel of the object to be formed in the die. The blank in which the die is to be formed is made of mild, low-carbon, carburized steel and is the same diameter as the hob. The hob and the blank are enclosed in a case hardened steel chase ring which is of ample size to support the strain exerted by the hob and to guide it in action. The hobbing operation is slow, as the metal of the die flows slowly, condensing and hardening under the hob and necessitating removal of the blank for annealing as the hobbing progresses. The alternate work of hobbing and annealing is performed on groups of dies, reducing the cost per die to a minimum.

Most dies can be hobbed from a flat surface. However, in deep dies, when the shape lends itself to accurate machining, a preliminary cavity

(*Concluded on Page* 60)

Corrosion Effects of Lubricants Upon Be

THE beneficial effects of various additions to mineral lubricating oils is now generally recognized. The addition of vegetable and fatty acids to mineral lubricating oils seems fully established. In like manner the benefits of saponified vegetable and animal oils for the production of greases, or so-called congealed oils, have become generally recognized. Besides the foregoing, it has been shown more recently that the oxidation of mineral oils can improve their lubricating value[1]; this oxidation of the oils in these considerations may therefore likewise be regarded as an addition. Accordingly, it will be of interest to consider the chemical effect of these additions to the mineral oils, that is, their effect upon the bearing surfaces, their selective corrosion upon these surfaces and their possible effects upon "running-in."



A limited or beneficial corrosion of the softest formation in a copper-tin bronze; 200 diameters.

Broadly, the corrosive effect upon a bearing surface in actual service can be of an exceedingly complex nature. It may be a purely chemical reaction; it may be an electrolytic effect, due either to the difference of electrical potential between different metals or an electrical current direct or induced; or lastly, it may be electrolysis accompanied by a chemical reaction[2].

[1] Beneficial effect of oxidation on lubricating Properties of Oil, R. O. King, Royal Society Proceedings, v 139 n A 838, Feb. 1, 1933.

[2] Die Ursache der Korrosion von Kraftfahrzeugteilen durch Schmiermittel, Wawrzinok, Automobiltechnische Zeitschrift, vol. 35, Sept. 10, 1932.

[3] A study of Bearing Metals, C. H. Bierbaum, Transactions Am. Inst. Min. & Met. Engrs., 1923, p. 972.

In these investigations the purely chemical effect only is taken into consideration, for the reason that they were conducted in the following manner: The oils with or without additions were put into a beaker and placed upon a laboratory hot plate, at a temperature of substantially 150 deg. F., air was introduced through a glass tube and caused to bubble through the oil. Various polished metallographic specimens of different bearing metals were placed one at a time in the oils and the resulting effects given microscopical study.

By means of high-power microscopical examinations, exceedingly slight corrosive effects can be detected long before they are apparent to the naked eye; this is especially so in observing minute selective corrosion effects. Under these conditions, it was, therefore, impossible that any extrinsic electrolytic effects should exist, chemical effects only being brought into play.

Certain definite and well known facts, however, must be taken into consideration beforehand; namely, that the hard and soft crystals, of which all bearing metals of necessity must be composed, have different chemical compositions. It, therefore, is evident that if these additions to the mineral oils have any corrosive action upon a bearing surface, a selective corrosion can exist; that is, either the hard or the soft crystal may be subjected to the greater corrosive action, or the corrosive action may attack the different formations more or less equally and result in a general surface corrosion. On the other hand, there may be no microscopically noticeable effects; the latter conditions under high magnifications are exceedingly rare.

Why Additions to Mineral Oils Prove Beneficial

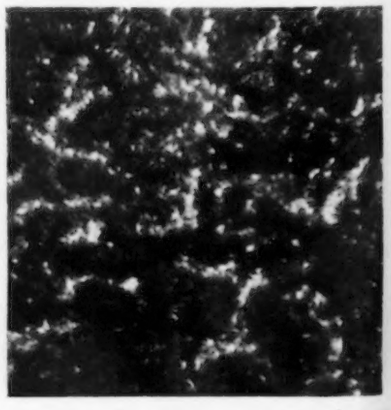
It stands to reason that any fluid which has even the slightest chemical action upon a bright metal surface will have a greater wetting action or capillary affinity upon such a surface than a fluid which is absolutely neutral. This fact, in a measure, no doubt accounts for the beneficial effects that have been experienced with the additions to mineral lubricating oils. In addition to the increased adhesions produced by such additions, a very slight corrosion upon the bearing surface by such additions may not be injurious but distinctly beneficial. If this corrosion tends to corrode only the softest crystal and the corrosive action at this point be either limited or inhibited by such corroded surface, then the slight microscopical depressions between the hard bearing crystal are increased by this chemical action and the aggregate amount of lubricant in the film is correspondingly increased and an improved bearing conditions results[3].

All pure light-colored mineral lubricating oils seem to have no corrosive action on bright metal surfaces. After they have been subjected to oxidation, however, and begin to show a reddish discoloration, which indicates acidity, they begin to be corrosive to different metals in varying degrees. This corrosive action increases as oxidation progresses to a fixed point.

The pure fatty acids are all more or less corrosive upon the ordinary metals and subjecting them to oxidation increases their corrosive effect. If fatty acids are added to the pure mineral lubricating oils, the resulting mixture is likewise corrosive, though in a correspondingly less degree than the concentrated acids. When sub ecting these mixtures to oxidation they become increasingly corrosive.

No Lubricant Should Carry More Than Trace of Sulphur

Small percentages of fractionated asphaltum have been used in lubricating oils with very beneficial effects, especially on badly worn surfaces, or where insufficient bearing areas existed. The slight corrosive effect of



Excessive and destructive corrosion upon all formations upon a copper-tin bronze; 200 diameters.

on Bearing Surfaces

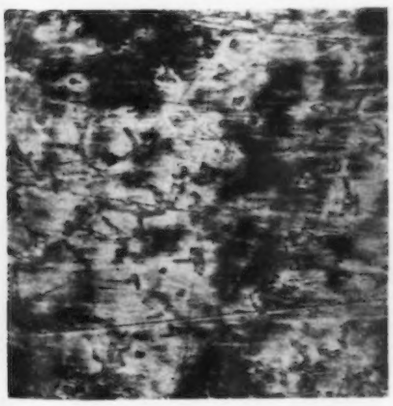
By CHRISTOPHER H. BIERBAUM
Vice-president, Lumen Bearing Co., Buffalo

HERE is a pioneering contribution to a phase of bearing technology that the author believes will prove to be the introduction to years of exhaustive study. Coming from one who has blazed new trails in determining the hardness of individual crystals in metals and whose name, indeed, has been for years virtually synonymous with bearings, his observations regarding the beneficiation of lubrication will receive profound attention in both industrial and scientific circles.

this asphaltum seems due in part to the percentage of sulphur it contains. The same is also true for mineral oils having a small sulphur content in their natural composition. Flour of sulphur can be readily dissolved in mineral lubricating oils and is one of the most corrosive constituents that has been added to lubricating oils.

The corrodibility of the different bearing alloys naturally depends upon that of their constituents and the combinations in which these constituents exist in these alloys. Copper is very susceptible to the corroding action of sulphur; even a minute trace will produce a distinct effect. In the copper-tin bronzes the softer alpha crystal with the higher copper content is first to be attacked. A trace of sulphur, sufficient only to corrode the softest crystal and not sufficient to produce general corrosion or pitting, therefore can be beneficial.

On the other hand, if the amount of sulphur is appreciable, the corrosion upon the surface of a copper-tin bronze becomes general on all formations, and in addition, it has a destructive pitting effect.



A uniform corrosion on all formations of a copper-tin bronze; 200 diameters

Sulphur has a likewise strong affinity for lead and its action upon a lead-base babbitt is naturally dependent upon the amount of sulphur present, its affinity being greatest for the lead. Therefore, its attack is greatest upon the matrix and less upon the lead-antimony crystal and least upon the tin-antimony crystal.

Sulphur has a very slight action upon tin and for that reason its effect upon a tin-base babbitt is slight, though if it exists in a sufficient amount, it attacks the hard tin-antimony and the tin-copper crystal in preference to the matrix. This corroding of the hard bearing crystals must of necessity be destructive to a bearing.

From the foregoing considerations, therefore, sulphur should never exceed a slight trace in any lubricant.

Oleic Has Two-Fold Beneficial Effect

Of the fatty acids, Oleic seems of greatest interest, both in its effect and in being the more readily available. It is far less corrosive than sulphur and in general has the virtue in dilute form of not corroding the hard bearing crystals in either the copper tin bronzes or the tin-base or the lead-base babbits. Its corrosive effect naturally increases with oxidation. Its presence in amount of a fraction of one per cent in mineral lubricating oil appears to have a two fold beneficial effect: that of increasing the capillary affinity for the metal surfaces and a slight etching effect upon the softer crystal of the ordinary bearing alloys, which increases the amount of oil in the film.

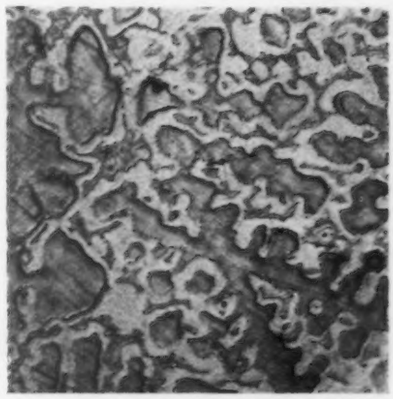
Stearic acid is rather passive; it increases the viscosity of oils and after oxidation shows but slight chemical activity.

Value of Oxidation of Mineral Oil

The oxidation of mineral oil in service without any other addition can have three distinct effects, and the beneficial results obtained, due to such oxidation, can be attributed to one or more of these effects, namely: an increase of viscosity, an increase of chemical activity and affinity, and a limited etching action giving an increased amount of oil in the film.

A saponified oil presented an interesting condition, in that, this grease in its prepared state in a pure anhydrous condition showed no chemical action upon a copper-tin bronze; after absorbing considerable moisture, however, its full alkaline nature became manifest by its distinctive selective corrosion effect; therefore, the performance of the saponified oils may depend upon the amount of moisture present.

Unless actual service conditions are duplicated in bearing tests, the results of such tests are meaningless. In order to secure satisfactory conditions in actual service, the one all-important objective is that of producing "run-in" surfaces upon such bearings. On the other hand, in destructive or short-time bearing testing, such conditions can never obtain, since the efforts are in a diametrically opposite direction. These facts, together with the distinct chemical effects make it important that in all bearing research, the "run-in" surfaces should be studied microscopically, since these surfaces are not only subjected to mechanical abrasion but to a distinct chemical action likewise.



A selective corrosion by saponified oil after it was saturated with moisture; 200 diameters.

Conclusions

The purely chemical effects of a lubricant upon bearing surfaces may be as follows:

(1) They may have no effect, a condition exceedingly rare.

(Continued on page 58)

Continuous-Type Furnaces Employed in Forging Aluminum Alloys

By J. B. NEALEY
American Gas Association, New York

FORGED aluminum alloy products have improved physical characteristics, just as do forged steel parts; and the physical properties of both are augmented considerably by heat treatment. While it requires a heat of 2400 deg. F. or more to form steel, aluminum alloys can be forged at a temperature of only about 840 deg. F. On the other hand, aluminum alloys are much more difficult to forge than is steel and require from 20 to 30 per cent more power.

Among the "strong" aluminum alloys there are two that are standard for forging: *1*, 51S with 48,000 lb. per sq. in. tensile strength; and *2*, 25S with 58,000 lb. tensile. By adding 0.35 per cent magnesium to the latter, the tensile can be raised to 65,000 lb. (These are the tensiles obtained after heat treating.) In addition to the aluminum the first of these contains also 0.6 per cent magnesium and 1.0 per cent silicon while the second consists of about 4.4 per cent copper, 0.8 per cent silicon and 0.75 per cent manganese. Several other aluminum alloys are also employed for forging but the above are the ones used most frequently.

The billets are first reduced from the cast ingot by 80 per cent or more, just as in steel forging, and the latest practice is to so control the grain flow, during both reduction and forming, that none of the lines or fibers will kink or run out at the edges to form weakening parting lines. This practice is carried out in the forging division of the Bohn Aluminum & Brass Corpn., Detroit. Here bar stock is sawed into proper lengths called slugs and these are heated to forging temperatures in gas-fired furnaces.

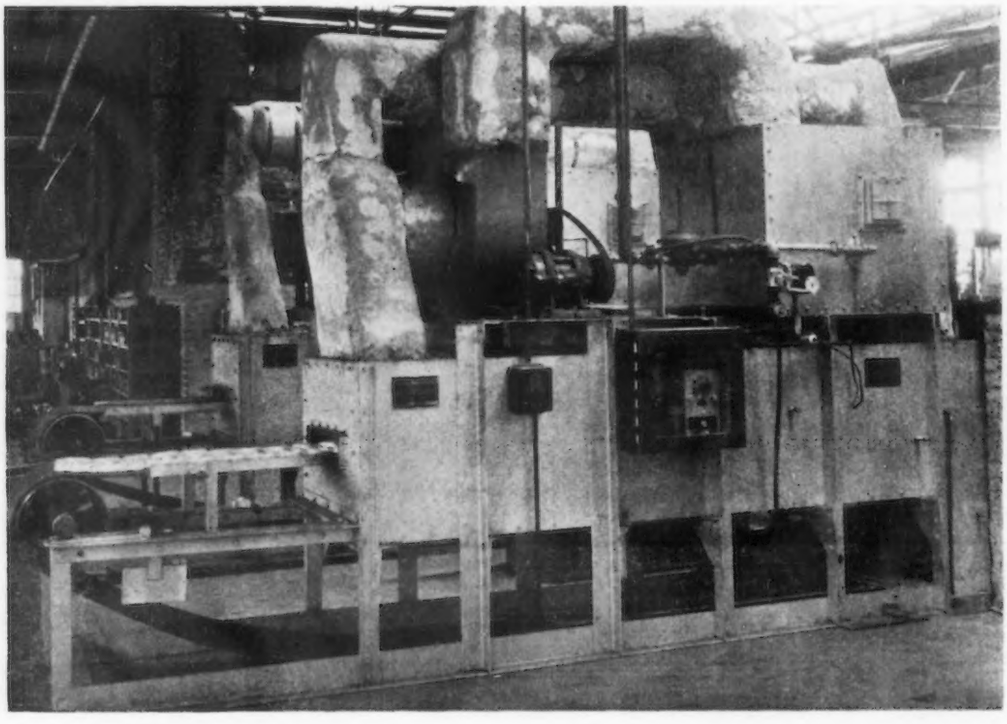
Furnace Heat Controlled Automatically

These medium temperature furnaces are automatic and continuous in both heat control and operation. The stock is carried through slowly on a wire mesh belt conveyor, looped and suspended between pulleys and driven by motor through a speed reduction gear train. The conveyor extends 3 ft. beyond the charging end and 1 ft. beyond the discharge end to facilitate the handling of the work.

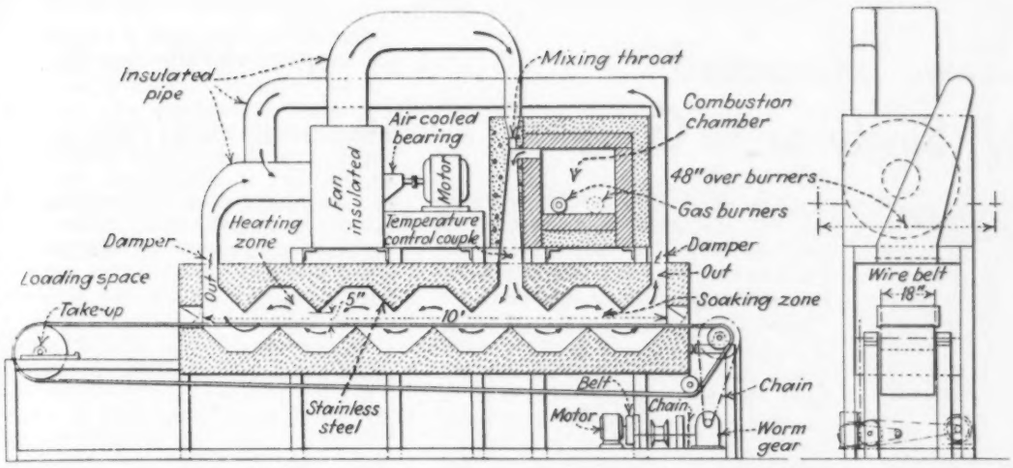
Positive circulation and recirculation of air heated to the proper temperature is the most essential factor in the design of low and medium temperature furnaces. This is the most effective method of maintaining a thorough and continuous distribution of a sufficient volume of low or medium temperature heat to all parts of the work.

The aluminum forging furnaces at the Bohn plant are the most modern and efficient of their type. Heat is supplied to them by separate heating chambers, located on top. The furnaces and heaters are so interconnected by ducts, employing forced and induced drafts, that the maximum of heat input to the work is obtained with a minimum of time and fuel consumption. The furnace proper consists of a steel case lined with 18-8 stainless steel with 6-in. thick insulation between. It is 11-ft. long, 3-ft. wide, 3-ft. high and stands on 3-ft. legs so that the lower half of the loop conveyor can return underneath.

The heater is steel encased and lined with 4½-in. of firebrick and the same thickness of insulation. It is fired with two alloy-tipped tunnel gas burners and the gas and air are proportioned by means of a low pressure proportional mixer. The combustible



REAR view of aluminum heat-treating furnace showing the separate gas-fired heater (at the right) and automatic temperature control equipment.



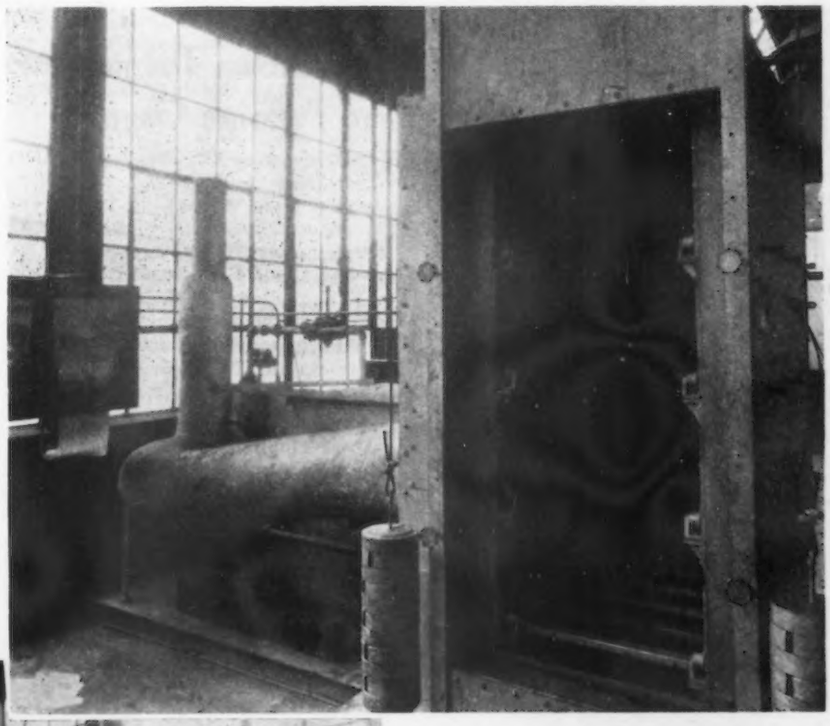
THIS sketch of the aluminum forging furnace shows arrangment of heating chamber, ducts, conveyor, and the sawtooth baffling of heating and soaking zones.

mixture passes through four vents, lined with high refractory brick, into the alloy mixing throat, where it is intimately mixed with the recirculated air, so that the temperature is even all the way across the inlet to the oven.

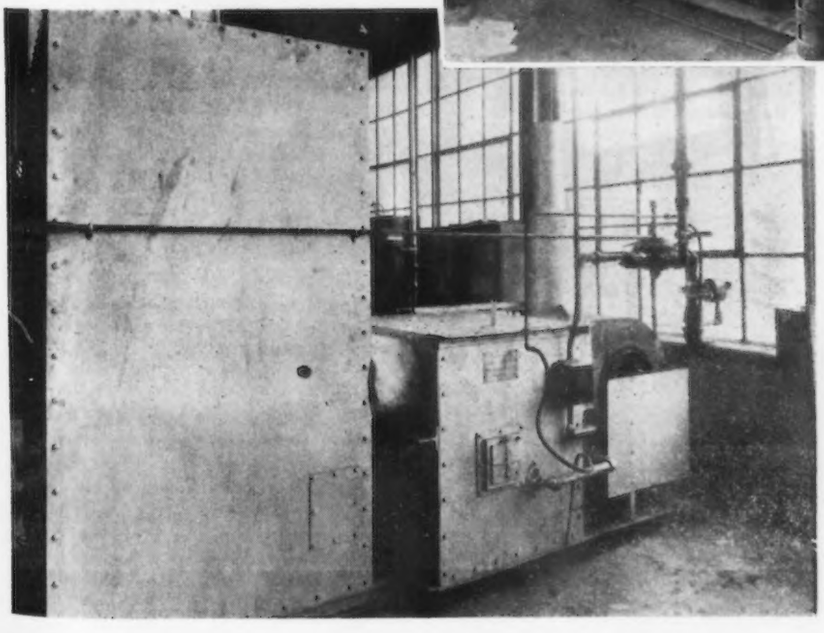
The hot products of combustion are then forced into the oven midway between the inlet and outlet ends, most of it flowing toward the charging end, to heat the incoming work, and the balance toward the discharge end for soaking. From both ends of the oven, ducts return the spent gases to the fan intake to be forced past the vents of the combustion chamber as already noted.

No reversing damper to "throw" the heat in all directions is necessary because the roof and bottom are baffled or sawtoothed. This type of construction forces the continuous stream of heat back and forth through the wire mesh conveyor hearth, so that the work receives and absorbs the maximum amount of heat.

Burners are of premix type, a low pressure proportional mixer supplying a gas and air mixture to the burner and a blower driven by a motor furnishes air for combustion. The automatic temperature control consists of a thermocouple in the main duct, a potentiometer controller and a reversing motor valve in the air supply line.



GAS-FIRED forging furnaces at the Bohn Aluminum & Brass Corpn. plant. Operation is continuous and temperature is controlled automatically.



ALUMINUM heat-treating furnace for low and medium temperatures. The capacity is for four trays of work, which are moved into the oven on the rollers shown. Arrangement of the heating system is such that there is considerable turbulence of heat in the oven.

Heat-Treatment Follows Forging

The heated slugs are formed into various parts by power hammers equipped with dies and are then heat

(*Concluded on Page* 58)

Small Metal Saws Sharpened Automatically, Singly or in Gangs

FOR sharpening and gumming small metal cutting saws singly or in gangs the Hanchett Mfg. Co., Big Rapids, Mich., is offering the new automatic grinder illustrated. Saws of the same size and tooth spacing are lined up on an arbor at the front of the machine and ground completely at one setting. The machine automatically indexes the gang of saws, one row of teeth at a time, and the grinding is done with the wheel of suitable thickness and proper shape to sharpen the tooth points and gum the throats in one operation.

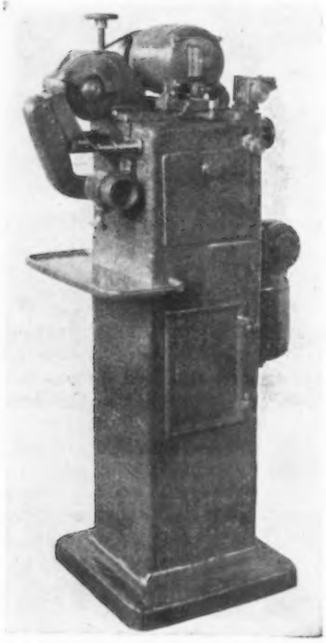
The grinding wheel head reciprocates on dovetail horizontal slides, protected from dust and grit and gibbed to take up wear. The grinding wheel is adjustable vertically by handwheel, and may be locked in position by a knurled nut. The spindle is ⅞-in. in diameter and is mounted in double-row precision ball bearings protected against dust and grit by means of oil seals. It is driven by endless belt from a ¼-hp. 1800 r.p.m. motor and has a speed of 4500 r.p.m. A spring tension device between the motor and the spindle assures uniform pull regardless of the vertical position of the wheel head.

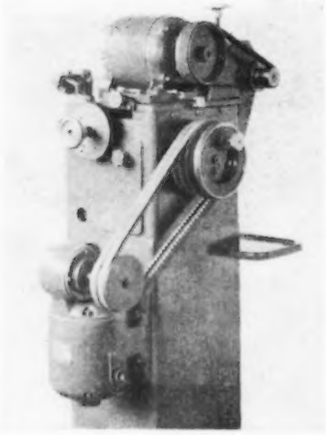
Feeding of the saw is by index plate with the feed index placed at the rear of the machine away from dust and grit. This allows ample space for use of an index plate considerably larger than the saws to be ground and with index teeth larger than teeth in the saws, a feature emphasized as resulting in greater precision and accuracy, especially when grinding fine tooth saws. It is stated that the machine will grind a gang of saws up to the full capacity of the machine within a variation of plus or minus 0.001 in. of exact diameter.

The reciprocating head mechanism is actuated by a second motor through V-belt drive to a clutch pulley; the latter can be instantly thrown in or out of connection and the handwheel can be used for making preliminary adjustments. The machine is arranged to index the saw either after one pass or two passes of the wheel across one row of teeth. A stop or aligning gage is provided for quickly lining up the saw teeth when placing the saws in position for grinding.

A 5-in. diameter, 3-16-in. thick grinding wheel is employed. A universal emery wheel dresser is regularly supplied for dressing and shaping the wheels, but a sliding-type diamond dresser mounted on the wheel-guard can be furnished. This dresser has vertical adjustment for changes in wheel diameter, and angular adjustment to meet a wide range of tooth shapes.

The capacity of this grinder, designated as the No. 21, is for saws from 2 to 5 in. in diameter, with tooth spacings up to ⅜ in. from point to point. The cutter arbor has capacity for 18 saws, 0.040 in. thick, 4 in. diameter, 60 teeth, or 30 saws 0.030 in. thick, 4 in. diameter, 90 teeth. Floor space of 20 x 32 in. is occupied by the machine. The weight, crated, is 500 lb.





SAWS from 2 to 5 in. in diameter may be sharpened rapidly on this automatic grinder. The motor drive arrangement for reciprocating the grinding head is shown in rear view below.

New Brown Thermometer and Pressure Gage

THE improved line of 8 and 12-in. circular chart instruments being placed on the market by the Brown Instrument Co., Philadelphia, include thermometers of indicating and recording types for temperatures from —40 deg. F. up to 1200 deg. F., and indicating and recording pressure and vacuum gages for ranges from 10 in. water up to 5000 lb. All types are offered in one, two and three pen models.

In developing the new thermometer line, considerable research is said to have been devoted to improving the helix mechanisms (Bourdon tubes). The mercury-filled helix is made of a stainless steel, said to withstand a 100 per cent overload, and provides a surplus of power to move the pen. The gas and vapor type helices are made of heat-treated phosphor bronze giving increased ruggedness and power. These thermometers may be located at distances up to 200 ft.

In the pressure and vacuum gages three different types of actuating movements are employed. For ranges

from 10 in. of water to 30 lb. a flexible metal diaphragm is used. For ranges from 30 to 200 lb. a spring-opposed bellows has been developed. For pressures above 200 lb. a helix is employed.

An electric clock, eliminating daily hand winding, is standard equipment, but where a.c. current is not available, hand-wound clocks are furnished. The instrument cases are of die-cast non-corrosive aluminum and are interchangeable for back or bottom connection or for flush panel mounting. Other features include a convenient toggle switch for starting and stopping the electric clock. A convenient micrometer thumb-screw facilitates recalibration, if the range of the instrument is to be changed after calibration. A wide variety of sizes and shapes of bulbs is available, and also a wide choice of standard charts.

Drilling Machine Features Smooth Hydraulic Ram Feed

TREMORLESS action of the hydraulic ram feed is a feature of the No. 2-H Hydram driller being placed on the market by the Barnes Drill Co., Rockford, Ill. Hydraulic feeding pressure is applied directly over the center of the cutting tools. The large diameter ram employed is said to provide great stiffness of the sleeve or ram against lateral strains and to eliminate the need of a long saddle on the column ways for maintaining alinement, a short saddle on the column taking the torque of the drive shaft. The hydraulic cylinder, large ram and spindle comprise an individual unit. The large diameter guide bearings, widely separated, afford rigid support for the ram, which carries the spindle or multiple head.

Driving power is transmitted directly to the cutting tools with a minimum of torsional vibration. This is accomplished through a reduction of speed from a vertical shaft to a comparatively short, large-diameter spindle by gears carried in a case on the nose of the ram.

The hydraulic unit is designed for versatility of spindle travel and multiple head interchangeability, and is suitable for vertical, horizontal or angular application. With the hydraulic control, automatic rapid approach, feeding rate, hydraulic dwell for facing, and automatic rapid return may be obtained as desired by setting the control stops. By means of a volume regulator instant change may be made in the rate of feed.

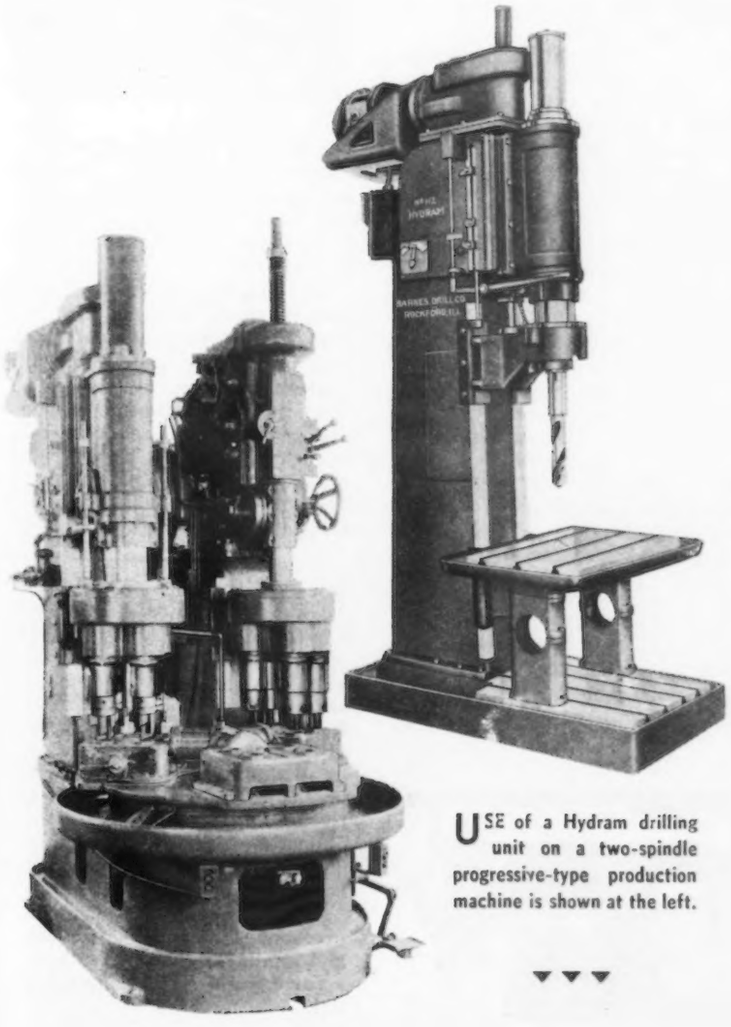
The machine is of sturdy design throughout. It is offered for production work in boring, reaming and facing operations; also for use with any layout of multiple heads. The ram can be furnished with or without a flange. By special adaptation, the Hydram unit may be employed for cylinder boring, and also for use independently of the machine frame, such as a separate drilling head.

Specifications include: Capacity, high-speed drills in S. A. E. 1035 steel, 2 in.; normal swing, 24 in.; maximum distance from No. 5 taper spindle to regular table, 31¼ in.; table working surface, 18 x 26 in.; vertical travel of spindle, standard, 16 in.; and vertical travel of the table, 23 in. For drilling up to 2 in. in steel, a 7½-hp. 1800-r.p.m. motor is recommended. The weight of the machine is 4400 lb., net.

Use of the Hydram driller, outlined above, in a two-spindle progressive-type production unit fitted with four-spindle heavy-duty heads is shown at the left in the second illustration herewith. A Barnes standard No. 242 self-oiling all-geared tapping head is also employed; this head is equipped with a geared thread leading feed for accurate tapping and also with the company's hydraulic remote control for the multiple disk clutches.

The rotating table of this machine is of hydraulically-indexing three-station type, with quad workholders. In the first station union nuts or similar pieces are bored and faced, four pieces simultaneously, while in the second station four of the pieces are tapped. During these machining operations the spare fixture is reloaded by the operator. All fixtures are air-operated. In the coolant and chip trough that surrounds the table there is a chip sweeper which operates with each indexing of the table, sweeping the chips into a receptacle at the rear.

At each indexing, when the plunger seats, the hydraulic valve control causes each spindle to rapidly approach the work, feed at predetermined rate, or as per pitch of tap, feed to the desired depth. With the Hydram unit for the facing operation, a hydraulic dwell is possible in connection with the strain rods shown for the exact depth, leaving a very smoothly faced job. Likewise, the tapping head trips at a predetermined depth, backing out at an increased speed in the ratio of 1¾ to 1, and stops at the uppermost position. The slowest operation, in this case boring, controls the output. This machine was built for export to Spain.

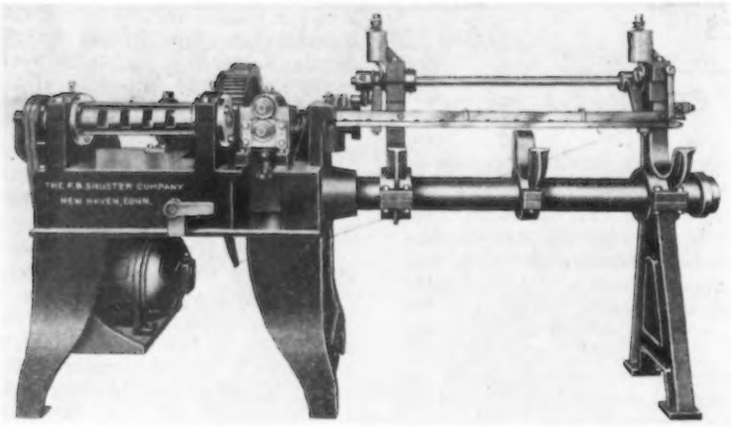


USE of a Hydram drilling unit on a two-spindle progressive-type production machine is shown at the left.

▼▼▼

FOR ventilating and driving off obnoxious gases from manholes, tunnels and other inclosed places where electric power is not available, a gasoline engine driven blower has been placed on the market by the Coppus Engineering Corpn., Worcester, Mass. The power end of the unit is a ¾-hp. air-cooled gasoline engine, operating at 1800 r.p.m., mounted on heavy coil springs to cushion the vibration. The fan delivers 1550 cu. ft. of air per min. By means of 8-in. diameter flexible tubing, of proper length, the air flow can be directed to any desired point.

The ventilating unit complete weighs 105 lb. and can be set up on any space 2 ft. square.



Wire Straightened and Cut at High Speed

A RECENT addition to the line of automatic wire straightening and cutting machines made by the F. B. Shuster Company, New Haven, Conn., is the new "High-Speed' machine here illustrated. Advantages claimed include the almost continuous movement of the wire, accomplished by the use of a specially designed cut-off cam, and a special clutch which is practically instantaneous in operation. High speed is possible in the cut-off because the cover which closes the guide bar (the bar into which the wire is fed to be cut off) is operated independently of the cut-off lever and the guide bar itself is permanently fixed to the uprights.

The straightening flier, the flywheel, and also the high-speed driving shaft are mounted on ball bearings. The handwheel adjustment for the feed rolls is located in an opening in the bed of the machine, and the lower roll boxes are released at the time of cutting off. Breaking rolls can be supplied, if desired, although the machine is not equipped with rear rolls.

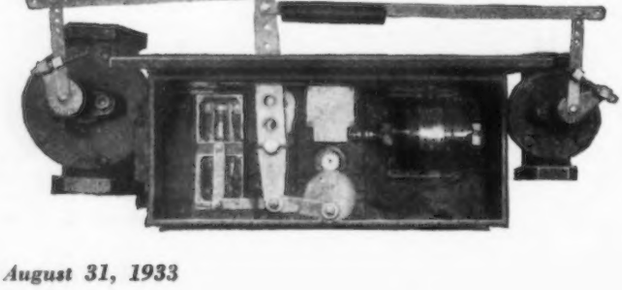
There is a substantial bed, mounted on heavy legs, and the piece supporting the extension is cast into the bed to provide a maximum rigidty. The motor is mounted underneath the machine. The extension is along the general lines of the company's standard construction, with forked holders for catching the cut lengths.

Multi-Position Control for Industrial Furnaces

FOR controlling the temperature of industrial processes in which the heat demand is subject to wide variations over varying periods, such as in a continuous-type heat-treating furnace located in a production line and subject to changes in flow of work being heat-treated, the Automatic Temperature Control Co., 34 East Logan Street, Philadelphia, is offering the new multi-position controller here shown.

This controller, designated as the type 395, is actuated by an instrument having five separate contacts, two each side of the normal setting, or the equivalent, which can be obtained through the use of available relays. Through a positive limit switch arrangement, each intermediate contact between extreme low and extreme high contacts in the actuating instrument has two definite valve positions, so that on making one of these contacts, following a drop in temperature, the valve opening and hence the resultant fuel supply is greater than when the same contact is made following a rise in temperature. Thus, it is possible to assure a fuel supply more consistent with the fuel demand.

It is stated that this controller is practically independent of time lag conditions and is therefore able to make the necessary adjustments to keep a furnace within narrow limits of the control setting under changing conditions of time lag. It is possible to get close control without "hunting."



MOTOR-OPERATED multi-position controller for processes in which the heat demand is subject to wide variations over varying periods of time.

New Welding Spectacles and Lenses

NEW welding spectacles, designated as the Oxweld No. 15, and a new lens, called the type AA, have been announced by the Linde Air Products Co., 30 East Forty-second Street, New York. The lenses of the new spectacles are mounted in a natural canvas-bakelite frame, and are 50 mm. in diameter—a width that permits a wider angle of vision and gives greater protection against light and sparks. The temples (bows) are covered with insulating material, and

the frame is non-inflammable and does not conduct heat. By means of a snap device where the temples meet the frame it is possible to spread the frame and change lenses in a few seconds.

The new type AA lens, flat ground and polished, is made in light, medium and dark green shades. It has high protective qualities, and its transmission percentages are said to meet the most rigid specifications for eye protection. Use of this lens is recommended where safety codes prevent the use of other lenses which are not flat ground and polished, although equally effective otherwise.

TWO diminutive size ball bearings have been added to the standard line offered by the Norma-Hoffmann Bearings Corpn., Stamford, Conn. They are the N-463, with ⅛-in. bore and ⅜-in. outside diameter, and the No. 4666, having a 3/16-in. bore and ½-in. outside diameter. Despite their small dimensions, these bearings are precision units containing, respectively, 12 and 17 balls of 1/16-in. diameter, with inner and outer rings finely ground and finished. These bearings are used extensively, both for rotating and oscillating loads, in precision instruments, scales, relays and similar light applications where accuracy and sensitiveness are essential.

CHART OF BASING POINTS for the IRON AND STEEL INDUSTRY taken from CODE OF FAIR COMPETITION

	ANDERSON, IND.	BETHLEHEM, PA.	BIRDSBORO, PA.	BIRMINGHAM	BUFFALO	BURNHAM, PA.	CANTON, OHIO	CHICAGO	CLEVELAND	COATESVILLE, PA.	COLUMBIA, PA.	CREIGHTON, PA.	DANVILLE, PA.	DETROIT	DOVER, N. J.	DULUTH, MINN.	ERIE, PA.	EVANSTON, ILL.	EVERETT, MASS.	GARY, IND.	GRANITE CITY, ILL.	GULF PORTS (1)	GULF PORTS (2)	HAMILTON, OHIO	JACKSON, OHIO	JERSEY CITY, N. J.	JOHNSON CITY, TENN.	KANSAS CITY, MO.	LEBANON, PA.	LORAIN, OHIO
Axles (rolled or forged)				●				●																						
Bale ties				●				●	●							●						●								
Bars—alloy steel, hot rolled		●			●		●	●																						
Bars—cold finished: carbon and alloy					●			●	●											●										
Bars—concrete reinforcing				●	●			●	●											●		●								
Bars—iron						●					●	●	●		●											●		●		
Bars—merchant steel				●	●			●	●											●		●								
Bars—tool steel		●																												
Girder rails																														●
Ingots, blooms, billets and slabs—alloy		●			●		●	●																						
Ingots, blooms, billets, slabs—carbon				●	●			●	●											●										
Light rails: less than 60 lb. per yd.				●				●																						
Mechanical tubing							●							●																
Pig iron—fdry., malleable, O. H. basic, Bess.		●	●	●	●			●	●					●		● 3)	●		●		●			●	●					
Pig Iron—low phosphorus			●																								●			
Pipe, rigid electric conduit																		●												
Pipe—std. line pipe and oil country tubular prods.																				●										●
Plates				●				●		●										●		●								
Rails, 60-lb. and heavier, rail joints and angle bars take f.o.b., mill base																														
Railroad tie plates				●	●			●																			●			
Railroad track spikes				●	●			●	●		●															●	●	●		
Sheet bars					●		●	●	●																					
Sheets				●																●										
Skelp					●			●		●																				
Steel sheet piling					●			●														●								
Strip steel—cold rolled									●																					
Strip steel—hot rolled								●																						
Structural shapes		●		(4) ●	●			●														●								
Tin plate, tin mill black plate and terne plate																				●										
Tube rounds				●	●			●	●																					
Tubes—boiler																														
Wheels, car, rolled steel								●																						
Wire—drawn, except as hereinafter specified	●			●				●	●							●							●							
Wire nails, staples, barbed wire and wire fencing	●			●				●	●							●						●								
Wire rods				●				●	●																					
Wire—spring								●	●																					
Wire—telephone									●																					

(1) GULF PORTS: Mobile, Ala., New Orleans, La., Orange, Tex., Port Arthur, Tex., Beaumont, Tex., Baytown, Tex., Galveston, Tex., Houston, Tex.

(2) GULF PORTS: New Orleans, La., Galveston, Tex., Houston, Tex. (drawn wire only).

(3) PIG IRON — Duluth, Minn. (except O. H. basic).

(4) SHAPES: Birmingham, Ala. (Standard shapes only).

DANVILLE, PA.	
DETROIT	● ●
DOVER, N. J.	
DULUTH, MINN.	● 3)
ERIE, PA.	●
EVANSTON, ILL.	●
EVERETT, MASS.	●
GARY, IND.	● ● ● ●
GRANITE CITY, ILL.	●
GULF PORTS (1)	● ● ●
GULF PORTS (2)	●
HAMILTON, OHIO	●
JACKSON, OHIO	●
JERSEY CITY, N. J.	●
JOHNSON CITY, TENN.	●
KANSAS CITY, MO.	● ●
LEBANON, PA.	● ●
LORAIN, OHIO	● ●
LOUISVILLE, KY.	●
MASSILLON, OHIO	●
MILWAUKEE, WIS.	●
MINNEQUA, COLO.	●
MUNCIE, IND.	●
NEVILLE ISL., PA.	●
PACIFIC COAST PTS. (5)	● ● ● ●

| | | |

German Iron and Steel Industry Put Under the Control of a "Czar"

HAMBURG, GERMANY, Aug. 23.—The German iron and steel industry is undergoing drastic changes. It has been put under the control of a commisar, with dictatorial powers, who has been authorized by the Government to reorganize the industry within six months. Dr. Scheer, son of Admiral Scheer, commander of the German fleet in the battle of Jutland, has been appointed to this office.

The Federation of Iron and Steel Industries is being dissolved and the industry is now being organized under a plan which provides for representation of works managers, directors, clerical workers, technical employees and manual workmen, who will have an equal voice in matters of common concern. However, owners and managers have been given absolute freedom of action in the control of sales, production and plant expansion. Previously it was necessary to obtain the approval of the Betriebsrat (works council).

Freedom to install new equipment is, however, conditioned. New machinery can be installed only if it does not reduce employment. On the other hand, every company installing new machinery replacing obsolete equipment (and meeting the previously mentioned requirement) is entitled to a reduction in income tax.

Discrimination between large and small buyers has been banned and hereafter uniform prices must be quoted to everyone.

The large companies are being split up into the constituent units which were combined to form them. The splitting up of the Vereinigte Stahlwerke (United Steel Works) has already gotten under way.

Large steel companies will be permitted to produce only a limited quantity of hardware and other finished products. Moreover, large companies will pay a turnover tax on all stages of production between pig iron and the finished product. Previously the turnover tax was paid only on the final product and this was to the disadvantage of non-integrated competitors who had to pay turnover taxes on the materials that they purchased.

No strikes or lockouts are permitted and all questions must be settled by a joint cooperative board representing employees and employers.

Steel companies are required to consume at least 135 kilos of German iron ore per ton of finished steel. The consumption heretofore has been 80 to 90 kilos. The object is to increase domestic ore output and to reduce scrap imports.

The iron and steel industry, as well as the coal industry, has subscribed to the Krümpersytem, under which plants that have been operating at a good rate are required to increase the number of shifts in order to employ idle hands.

Payment for industrial accidents will be trebled but other social charges have been greatly reduced. Every employee of an iron and steel company is required to give from ½ to 1 per cent of his wage or salary to a public works fund which will be used to create work for the unemployed.

Exports from Non-Cartel Countries Stimulated

HAMBURG, GERMANY, Aug. 23.—Restrictions imposed by the Continental Steel Cartel on the sale of steel products through exporters have resulted in a stimulation of the sale of steel from non-cartel countries. Unable to buy steel with assurance of a profit from cartel members, or to buy at all, exporters have been pushing the sale of Polish, Spanish, Swedish and Italian steel products. The result has been that these products have been sold for export at prices below those quoted by the Continental Steel Cartel.

Steady Rise in German Tin Plate Output

THE output of tin plate in Germany has shown a steady increase in recent years. It has been affected neither by the depression nor by the recent depreciation of the dollar, and is the only steel product which has shown an uninterrupted rise in exports. The following table shows the comparative exports of Great Britain and Germany during the first six months of recent years.

TIN PLATE EXPORTS, IN TONS, JANUARY TO JUNE INCLUSIVE

	Great Britain	Germany
1922.....	291,387	38
1925.....	413,187	188
1927.....	384,708	3,287
1929.....	324,387	10,287
1930.....	312,088	17,868
1931.....	294,391	22,185
1932.....	273,976	37,856
1933.....	228,443	58,865

The German tin plate industry is operating at 100 per cent and is increasing its capacity. Japan is its best foreign customer, although up to 1931 it had not purchased any tin plate from Germany.

Decline in Cadmium Output in 1932

The 1932 production of metallic cadmium in the United States amounted to 799,501 lb., against 1,050,529 lb. in 1931 and the record high output of 2,777,762 lb. in 1930. Domestic manufacturers produced 259,800 lb. of cadmium compounds—cadmium sulphide, oxide and lithopone—in 1932, as compared with the 1931 production of 337,200 lb., according to the Bureau of Mines. No cadmium metal was imported last year, which

markedly contrasts with the 200,000 lb. imports of both 1928 and 1929.

Domestic chromite production in 1932 was negligible, amounting to only 200 gross tons, against 762 tons mined in 1931. American chromite demands are mostly supplied by foreign pits, which in 1932 shipped 89,143 gross tons, constituting a sharp drop from the 212,528-ton level of 1931.

Domestic production of primary tin in 1932 amounted to only 0.4 gross ton, valued at $220. Imports of tin in 1932 aggregated 34,819 gross tons, valued at more than $16,000,000, which is about three times the amount of domestic secondary tin recovered. About 66,064 tons, with a $37,000,000 value, was imported in 1931. The average 1932 price level of Straits tin at New York was 22.01c. a lb., which was the lowest average offering price since 1898. Straits sold for 65.30c. a lb. in 1926.

July Sheet Sales Off, Shipments Higher

WHILE sales decreased sharply, production and shipments of sheet steel products during July increased for the fourth consecutive month. According to the report of the National Association of Flat Rolled Steel Manufacturers, Pittsburgh, which bases its figures on a monthly capacity of 325,000 net tons, or approximately 59 per cent of the country's total capacity of 550,000 net tons monthly, independent makers had sales of 174,191 net tons in July, compared with 246,737 tons in June; production of 188,143 tons as compared with 166,272 tons, and shipments of 174,145 tons as compared with 152,953 tons. Unfilled orders on Aug. 1 totaled 228,696 tons or 70.5 per cent of capacity, compared with 229,436 tons or 70.7 per cent of capacity during the preceding month. The July report with comparisons of the two preceding months in net tons follows:

	July	June	May
Sales	174,191	246,737	144,192
Production	188,143	166,272	139,696
Shipments	174,145	152,953	119,159
Unfilled orders	228,696	229,436	136,592
Unshipped orders	62,720	54,288	47,696
Unsold stocks	42,095	50,067	51,295
Capacity per month	550,000	550,000	550,000
Percentage reporting	59.0	59.0	59.0
Percentages, Based on Capacity			
Sales	53.7	76.0	44.4
Production	58.0	51.2	43.1
Shipments	53.7	47.1	36.7
Unfilled orders	70.5	70.7	42.1
Unshipped orders	19.3	16.7	14.7
Unsold stocks	13.0	15.4	15.8

The General Electric Co. and all its subsidiaries in the United States have been licensed by the Dardelet Threadlock Corpn., New York, to manufacture for their own use bolts, nuts, and other parts threaded with the Dardelet self-locking screw thread.

▲ ▲ ▲ THE NEWS OF THIS WEEK

British Steel Trade Hopeful Although New Demand Lags

LONDON, ENGLAND, Aug. 29 *(By Cable)*.—Cleveland steel works, in resuming operations after the holidays, finds that the accumulation of pig iron is less than usual and anticipate a rapid reduction in stocks. Foreign consumers are evidencing more interest in British pig although trade barriers tend to hamper the flow of business. Dearer ore and fuel have not as yet affected the prices of the product. Heavy arrivals of Indian pig iron are noted. Fresh demand lags for semi-finished steel but rollers are busy on previous contracts and some of them ignored the holidays. British finished steel makers are more hopeful because of an improved outlook for shipbuilding and because they have to meet fewer Continental offers.

Tin plates are dull but Welsh mills report unfinished orders to the amount of 3½ million basis boxes, which is but one half million below the record backlog. A decision is expected momentarily on the Argentine inquiry for 30,000 tons of galvanized sheets for locust destruction. Continental sales in the United Kingdom which were already curtailed, have reached the stagnation point owing to the rise of the franc. The Continental steel cartel has met with indifferent success since its formation and Belgian mills are approaching a critical position due to lack of orders. The Polish Government is planning a compulsory cartel for its steel makers. Poland has completed delivery of rails to Brazil under a barter arrangement and hopes to secure further similar business. Germany's Bochum and Dortmund steelmasters are introducing the 40 hr. week. The French Societe des Acieries de Longwy are lighting a furnace at Thionville. British prices are unchanged except for a reduction in tin plate and Continental prices are unchanged from last week.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open hearth	£5 to £6 7s. 6d.
Black sheets, Japanese specifications	£11
Tin plate, per base box	16s. 6d. to 17s.
Steel bars, open-hearth	£7 17½s. to £8 7½s.
Beams, open-hrth.	£7 7½s. to £7 17½s.
Channels, open-hearth	£7 12½s. to £8 2½s.
Angles, open-hearth	£7 7½s. to £7 17½s.
Black sheets, No. 24 gage	£9
Galvanized sheets, No. 24 gage	£11 to £11 10s.

Continental Prices, f.o.b. Continental Ports

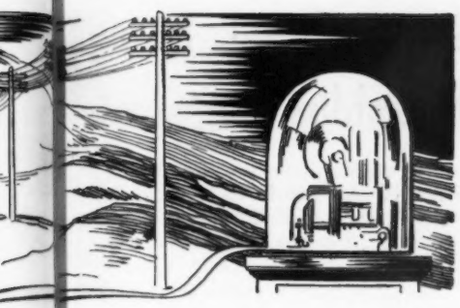
Per Metric Ton, Gold £ at $4.86

*Ingots	£2 5s.
*Billets, Thomas	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Black sheets, No. 31 gage, Japanese	£11 5s.
*Steel bars, merchant	£3
*Sheet bars	£2 8s.
Plates, ¼ in. and up	£3 18s. 6d.
*Plates, ⅛ in. and 5 mm.	£4 1s.
*Sheets, ⅛ in.	£4 6s.
*Chip plates	£4 10s.
*Beams, Thomas	£2 16s. 6d.
*Angles (basis)	£3
Hoops and strip steel over 6-in. base	£3 15s.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£3 15s.

*Prices as established by European Raw Steel Cartel.

Milwaukee Shows Continued Gains

Milwaukee metal trades employment in July showed an increase for the fourth consecutive month. Thirty-nine shops reported to the Milwaukee office of the National Metal Trades Association aggregate payrolls of 10,778, compared with 9399 in June.



THIS WEEK ▲ ▲ ▲

The gain of 1379 is the largest monthly rise so far recorded this year. Secretary William J. Fairbairn said the largest increases are in shops supplying breweries with machinery, equipment, steel barrels, etc. However, the most fundamental factor, he said, lies in the statistics which show "a little upturn here and there and a small but steady improvement generally in this area." Average hours worked per man per week in July stood at 39.3, compared with 28.7 in July, 1932.

Manganese Producers Petition President

AMERICAN Manganese Producers Association has petitioned the President, after such investigation and hearing as is prescribed by and subject to the limitations contained in Title I of the National Recovery Act, to forbid importation, to add such fees, and to limit imports of all manganese bearing ores, alloys and/or products for use of the manganese content in the manufacture of other products, to such extent as may be necessary to enable the domestic producers to enjoy domestic markets for such ores, alloys or products in accordance with the purposes of the Code of Fair Competition of the Manganese Industry and the National Recovery Act.

This is to effectuate the policy of the National Recovery Act, and in order that imports shall not render or tend to render such code ineffective.

Reorganization Plan for Empire Steel

A PLAN of reorganization for the Empire Steel Corpn., Mansfield, Ohio, with plants also at Cleveland, Niles and Ashtabula, Ohio, has been announced by F. A. Scott, chairman of the reorganization committee. The Mansfield plant has been operated since May, 1931, by C. H. Henkel, receiver.

The plan provides for the formation of a new company to acquire the plants and assets and the raising of $500,000 new capital through common stock and a bond issue. The proposed corporation will have an authorized capital of 125,000 shares of no par common stock and an authorized first mortgage bond issue of $1,500,000. The preliminary plan does not contemplate the acquisition of the Cleveland plant, although this may be included later if the bondholders of the Cleveland plant join in the plan.

Of the capital stock approximately 53,000 shares are to be issued to present bondholders and creditors. A total of 15,000 shares will be issued to subscribers of new bonds who will receive for each $100 of new capital a unit consisting of a $100 par value of bonds and three shares of common stock. Ashtabula Steel Co. bondholders are to receive bonds equal to 15 per cent of present bonds and one share of stock for each $100 of the balance of principal and interest. Mansfield Sheet & Tin Plate Co. bondholders are to receive new bonds equal to 20 per cent of their bonds and one share of stock for each $100 balance of principal and interest. General creditors are to receive one share of stock for each $100 of claims.

F. A. Scott is chairman of the bondholders' committee of the Mansfield Sheet & Tin Plate Co., W. A. Thomas is chairman of the Ashtabula Steel Co. committee and T. O. Kennedy is chairman of the general creditors' committee.

International Meeting on Corrosion

THE program of the meeting of the Electrochemical Society to be held at the Stevens Hotel, Chicago, Sept. 7, 8 and 9, has been announced. The first session, which will be an international gathering on corrosion, will be opened on the morning of Sept. 7 by the president, John Johnston, of the United States Steel Corpn., Kearny, N. J., and presided over by Dr. F. N. Speller, National Tube Co., Pittsburgh. It will be devoted largely to iron and steel, and its international character is indicated from the fact that contributions have already been received from the following:

S. C. Britton and Ulick R. Evans, of Great Britain, on protective painting, and A. W. Hothersall, Great Britain, on electro-deposited coatings on steel; E. Herzog, of France, on iron protection in aerated salt solutions; Manfred Ragg, Germany, on protective action of lead pigments, and Karl Daeves, Germany, on composition and pre-treatment of steels and the life of protective coatings; Lobry de Bruyn, The Netherlands, on corrosion of iron and steel; L. Hajda, Czechoslovakia, protecting steel against corrosion.

American contributors include Oliver P. Watts, on electrochemical theory of corrosion; K. H. Logan, on protecting pipes against soil action; C. D. Hocker, field corrosion; H. L. Lochte and R. E. Paul, electrochemical

Pig Iron Freight Rates from Everett, Mass., to New England Points Are Reduced

FREIGHT rates on pig iron from Everett, Mass., to 72 points on the New York, New Haven & Hartford Railroad were reduced in varying amounts, as posted in ICC F 3308, dated July 28, 1933, and effective Aug. 30. The revised rates and the amounts of reduction per ton are as follows:

From Everett, Mass., to	New Rate	Reduction
Ansonia, Conn.	$2.15	$0.63
Auburn, R. I.	1.30	.68
Branford, Conn.	2.00	.78
Bridgeport, Conn.	2.00	.78
Bristol, Conn.	2.30	.48
Brockton, Mass.	.94	.59
Campello, Mass.	1.05	.92
Cos Cob, Conn.	2.20	.78
Cranston, R. I.	1.30	.68
Cromwell, Conn.	2.15	.48
East Bridgewater, Mass.	1.06	.92
East Hampton, Conn.	2.15	.48
East Providence, R. I.	1.30	.68
Easton, Mass.	1.06	.92
Fairhaven, Mass.	1.45	.73
Fall River, Mass.	1.30	.68
Franklin, Mass.	1.06	.92
Groton, Conn.	1.90	.68
Guilford, Conn.	2.00	.78
Hartford, Conn.	2.00	.58
Haydensville, Mass.	2.45	.53
Hillsgrove, R. I.	1.45	.76
Hyde Park, Mass.	.82	.76
Lee, Mass.	2.60	.38
Mansfield, Mass.	1.06	.92
Meriden, Conn.	$2.15	$0.63
Middletown, Conn.	2.00	.58
Mt. Carmel, Conn.	2.15	.43
Mystic, Conn.	1.90	.68
Naugatuck, Conn.	2.30	.48
New Bedford, Mass.	1.42	.76
New Britain, Conn.	2.15	.63
New Haven, Conn.	2.00	.73
New London, Conn.	1.90	.68
Newport, R. I.	1.60	.58
North Attleboro, Mass.	1.18	.80
Norwalk, Conn.	2.35	.63
Norwich, Conn.	1.90	.68
Norwood, Mass.	.94	.69
Pawtucket, R. I.	1.30	.68
Phillipsdale, R. I.	1.30	.68
Plainville, Conn.	2.15	.63
Plymouth, Mass.	1.18	.80
Port Chester, N. Y.	2.20	.78
Portland, Conn.	2.00	.58
Providence, R. I.	1.30	.68
Putnam, Conn.	1.60	.58
River Point, R. I.	1.42	.76
Rocky Hill, Conn.	2.15	.43
Shelton, Conn.	$2.15	$0.63
Southbridge, Mass.	1.60	.58
Southington, Conn.	2.30	.48
South Norwalk, Conn.	2.20	.78
South Swansea, Mass.	1.30	.68
South Windham, Conn.	1.75	.63
Stamford, Conn.	2.20	.78
Stonington, Conn.	1.90	.68
Taunton, Mass.	1.18	.33
Terryville, Conn.	2.30	.48
Thomaston, Conn.	2.30	.68
Torrington, Conn.	2.30	.68
Wallingford, Conn.	2.15	.68
Walpole, Mass.	.94	.68
Waterbury, Conn.	2.30	.48
Weir Branch, Mass.	1.18	.33
Westerly, R. I.	1.90	.48
Westfield, Mass.	2.45	.13
Whitins, Mass.	1.30	.68
Whitman, Mass.	1.06	.92
Willimantic, Conn.	1.75	.63
Wollaston, Mass.	.82	.80
Woonsocket, R. I.	1.18	.80

behavior of iron in corrosion cells; L. E. Stout and Charles L. Faust, electro-deposition of iron, copper and nickel alloys.

A session on Sept. 8 will be devoted to electro-deposition, with some nine papers, including one by George W. Nichols, Madison, Wis., on a new bath for direct nickeling of zinc. A session on Sept. 9 will be given over to organo-electrochemistry and cells. Dr. Colin G. Fink, Columbia University, New York, is secretary.

Ohio River Steel Shipments Up

Shipments of iron and steel products on the Ohio River in the Pittsburgh district during July aggregated 62,096 net tons, compared with 56,484 tons in June, 46,038 tons in May, and 22,895 tons in July, 1932. Further figures on the report compiled by the United States Engineer's office, Pittsburgh, show steel shipments on the Monongahela River in July of 68,453 tons, compared with 58,179 tons in June and 13,677 tons in July last year. Shipments of iron and steel on the Allegheny River last month totaled 3900 tons.

Improved Bessemer Screw Steel Being Offered by Jones & Laughlin Company

DISTINCT improvement in Bessemer screw steel without change in its chemistry and physical properties has been achieved by the Jones & Laughlin Steel Corpn., Pittsburgh, through a purely scientific approach to manufacturing methods. Practical applications of the improved steel have shown production increases ranging from 11 per cent to 99 per cent. Although the new stock is just now being offered to the trade, it has been in use for a number of months for purposes of performance observation. It is made in both S.A.E. 1112 and high sulphur grades.

The increases in production reported are ascribed to one or both of two factors. Either machining time is reduced or tool life is extended, or both. Less energy is required in cutting and tools retain good cutting edges for longer periods. Machine time is reduced either through an increase in feed or speed, or both. An improvement in the quality of finished parts is also claimed. With less energy exerted through the tool, the tearing action is minimized, less destruction and deformation of the metal are noticed and, in consequence, a finer finish is obtained.

This important advance in the machinability of Bessemer screw steel is credited by the Jones & Laughlin Company entirely to its research departments. In the past, improvement in this product has resulted almost entirely from changes in physical properties, and improved results achieved through revised methods of manufacture have been largely lacking. The improved product, which will unquestionably result in worth while manufacturing cost reductions for consumers, is an excellent example of the steel industry's constant efforts to improve its service to the trade.

Cast Bronze Bushing Institute Formed

AT a meeting of the Cast Bronze Bushing Institute held in Detroit, August 16, for the purpose of effecting a permanent organization and adopt a code in conformance with the National Industrial Recovery Act, P. J. Flaherty, president, Johnson Bronze Co., New Castle, Pa., was elected president and chairman of executive committee; vice chairman, F. I. Boles, general manager, Kendrick Mfg. Co., Detroit; treasurer, D. K. McDonald, president, Buckeye Brass Mfg. Co., Cleveland, for a period of one year.

This association includes two hundred manufacturers engaged in the manufacture and sale of bronze products.

Wage Earners' Living Cost Still Rising

THE upward trend in wage-earners' living costs that began in May gained momentum in July, according to the index of the National Industrial Conference Board, the increase over June amounting to 3.3 per cent, as compared with 1.0 per cent in June over May and 0.8 per cent in May over April. Total living costs, however, were still 2.3 per cent lower than in July, 1932, and 24.8 per cent lower than in July, 1929.

The purchasing value of the dollar, computed on the base, 1923 = 100c., was 133.0c. in July, as compared with 137.4c. in June. The most striking advance was in food prices, which were 8.3 per cent higher in July than in June and 3.8 per cent higher than in July, 1932, but still 33.9 per cent lower than in July, 1929.

Last Minute Sales Leads

(Received too late for classification in our Plant Expansion Section)

Allied Mills, Inc., 141 West Jackson Street, Chicago, has organized a subsidiary to operate former distilling plants of parent company at Peoria, Ill., known as Atlas and Corning distilleries, respectively. Plants will be remodeled and new equipment installed. Cost over $100,000 with machinery. H. G. Atwood is president and chairman of board.

Ohio Brass Co., Mansfield, Ohio, manufacturer of electric railway equipment, brass specialties, etc., has let general contract to Timms Construction Co., 66 Randolph Street, Welland, Ont., for new plant at Niagara Falls, Ont., one-story, 200 x 500 ft., to be operated by Canadian Ohio Brass Co., Ltd., a subsidiary, and replacing local factory recently sold. Cost over $125,000 with equipment. H. G. Acres & Co., Ferry Street, Niagara Falls, Ont., are consulting engineers.

Commanding Officer, Watervliet Arsenal, Watervliet, N. Y., asks bids until Sept. 7 for 42 gun breech forgings and 42 breech block forgings (Circular 6).

Kling Brewing Co., Detroit, care of Louis Kamper, Inc., Book Tower Building, architect and engineer, has plans for new six-story plant, to include brewing, bottling, storage and distribution, and other departments, with power house. Cost over $500,000 with equipment.

Covert Gear & Mfg. Co., Grand and Lock Streets, Lockport, N. Y., has been acquired at a receiver's sales, Aug. 23, by F. H. Sore, Columbus, Ohio, representing Buffalo and Lockport interests. A new company will be organized to operate property for manufacture of gears, transmission systems, etc. Improvements will be made. About 100 men will be employed for initial operation.

Green Tree Brewing Co., 2421 South Eighteenth Street, St. Louis, Christopher Buehner, head, has taken over former meat-packing plant, and will remodel for brewery, including erection of two four and five-story additions. Cost over $350,000 with equipment. George E. Wells, Security Building, is architect.

United States Engineer Office, First District, Chicago, asks bids until Sept. 7 for new steam and compressed air plants at Dresden Island and Starved Rock locks and dams, including steam power plant, compressed air plant, water pumping station, piping, electrical equipment, etc. (Circular 16); until Sept. 18 for similar plant at Marseilles lock and dam, Illinois River, Marseilles, Ill. (Circular 3).

Eldorado Brewing Co., 626 North American Street, Stockton, Cal., has authorized plans for new four-story plant, with brew-house, mechanical bottling, cooling and other equipment. Cost about $125,000 with machinery. A. D. Rothenbush, address noted, is in charge.

Village Council, Mountain Lake, Minn., asks bids until Sept. 6 for municipal electric light and power plant and complete equipment, with electric distributing system. G. M. Orr & Co., Baker Building, Minneapolis, are consulting engineers.

Auto City Brewing Co., Hamtramck, Mich., is planning installation of additional equipment to increase capacity, to include settling tanks, fermenting machinery, brew-house, bottling and other equipment. Company is disposing of stock issue of $125,000, part of fund to be used for purpose noted.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 5 for 3000 doz. tungsten hacksaw blades (Schedule 587) for Mare Island Navy Yard.

Safe Padlock & Hardware Co., Lancaster, Pa., has been purchased by Fred A. Wiker and Douglas W. Franck, who have reorganized company and will operate under same name with Mr. Wiker as president and treasurer and Mr. Franck, vice-president and secretary. Company manufactures padlocks, night latches and builders' hardware and is operating under the new management with foundry and polishing equipment especially adapted to fabrication of light bronze and brass castings, which facilities are available to jobbing trade.

E. W. Carpenter Mfg. Co., Bridgeport, Conn., metal specialties, will erect a one-story addtion, 40 x 100 ft.

A. S. M. E. Machine Shop Meeting Is Scheduled

A FEATURE of the fifteenth annual National Metal Congress and Exposition, to be held in Detroit, Oct. 2 to 6, will be the meeting on Oct. 4, under the auspices of the Machine Shop Practice Division of the American Society of Mechanical Engineers. A. N. Goddard, of Goddard & Goddard, Detroit, will act as chairman of the technical session. C. L. Eksergian, chief engineer Budd Wheel Co., Detroit, will present a paper entitled, "Characteristics and Methods of Tests of Automotive Brake Drums." The second paper will be "Simplicity—the Solution of Extreme Accuracy in Quantity Production, by Gordon W. Evans, vice-president, in charge of manufacturing Kelvinator Corpn., Detroit. An inspection trip to the plant of the Kelvinator Corpn. has been arranged for the afternoon.

Welding Meeting Sessions Arranged

MORE than 20 papers will be presented at the five technical sessions of the Fall meeting of the American Welding Society, to be held at the Book-Cadillac Hotel, Detroit, Oct. 2-5. In addition, six papers are planned for the fundamental research session to be held Oct. 3 under the auspices of the American Bureau of Welding, the research division of the welding society. An inspection trip that will include visits to automobile body plants in the Detroit district has been arranged for the afternoon of Oct. 4. The meeting will close with the annual banquet, on the evening of Oct. 5.

British Iron and Steel Institute Will Meet

THE Iron and Steel Institute (British) will hold its autumn meeting at Sheffield, England, Sept. 12 to 15. Papers to be presented include the following: "Heat Conservation at the Normanby Park Steel Works, Scunthorpe," by W. J. Brooke; "Notes on the Utilization of Blast Furnace Gas," by W. B. Baxter; "Some Factors Leading to Greater Production from a Steel Furnace," by A. Robinson; "The Effect of Tin as an Impurity in Mild Steel," by J. H. Andrew and J. B. Peile; "Fifth Report on the Heterogeneity of Steel Ingots"; "The Influence of Beryllium on Steel," by J. H. S. Dickenson and W. H. Hatfield; "Alloys of Iron Research, Part XI.—The Constitution of the Alloys of Iron and Manganese," by M. L. V. Gayler; "A Coke-Fired Reheating Furnace," by F. Lloyd and R. V. Wheeler, and "Some Experiments on the Resistance to Wear of Nitrogen-Hardened Cast Iron," by J. E. Hurst. K. Headlam-Morley is secretary.

Fabricated Steel Backlog Rises to 347,279 Tons

JULY bookings of fabricated structural steel, with 175 reporting companies, were 56,234 tons, according to the American Institute of Steel Construction, Inc. Shipments at 50,973 tons were 15 per cent below the average monthly movements for the second quarter. Failure of the Federal Government to allow credit for public works is cited as the contributing cause for the decline.

At the end of July the bookings on hand for future fabrication were 347,279 tons, as reported by 100 companies or approximately 57 per cent of the industry. Negligible backlogs were reported by 35 companies, and 40 fabricators submitted no estimate on work ahead.

Canada Reports Increased Iron and Steel Output

PRODUCTION of pig iron in Canada totaled 31,689 tons in July. As shown by the official Dominion statistics, this constitutes the best output for any month during the past two years, and is almost as high as the 36,210 tons made during the entire first six months of the current year. A 275-ton furnace was blown in at Hamilton, Ont., on July 3, which raised the total of active furnaces to three.

July output of steel ingots and castings was the best since August, 1931, amounting to 49,076 tons, and representing a 67 per cent increase over the June figures. Production in July, 1932, was 27,506 tons.

Commercial Metal Treating Firms Organize

A NATIONAL organization for those engaged in commercial metal treating to be known as Metal Treating Institute was formed by representatives of 20 metal treating firms meeting at the Medinah Club, Chicago, on Aug. 18. By-laws were adopted and a code committee appointed.

The following officers were elected to serve until the next meeting of the institute, which will be held at Hotel Statler, Detroit, on Oct. 2 during the National Metal Congress and Exposition: C. U. Scott, president C. U. Scott & Son, Rock Island, Ill.; vice-president, T. E. Barker, president Accurate Steel Treating Co., Chicago; treasurer, W. S. Bidle, president W. S. Bidle Co., Cleveland, and secretary W. H. Eisenman, 7016 Euclid Ave., Cleveland.

Commercial metal treating firms interested in becoming members of the institute and in participating in the code should communicate with Mr. Eisenman.

New Lubricant Has Metallic Lead Base

A NEW lubricant in which metallic lead is the protective element and designated as Bestolife has been developed by the Armite Laboratories, 1450 East Sixty-first St., Los Angeles. The lubricant has a pure metallic lead base instead of lead salts and is said to be free from chemical reactions. The minimum constituency of lead in the material is 10 per cent, ranging up to 65 per cent. It is said to withstand temperatures up to 430 deg. F., and will not lose its lubricating stability entirely until the melting point of lead is reached, at 590 deg.

The principle application of the product in the metal field is as a gear and bearing lubricant, as well as for pump and valve packing, wire line and belt dressing.

Aluminum Manufacturers File Code

WASHINGTON, Aug. 29.—The Association of Manufacturers in the Aluminum Industry has filed a code of fair competition with the National Recovery Administration covering mining of bauxite, concentrates, virgin aluminum, sheets, shapes, forgings, castings, pistons, etc.

Hours are limited to 40 in continuous process and 42 in other process operations, as averaged over a six months' period, but in no one week more than 48.

Wage proposals include 25c. an hour for bauxite mining in the South; 35c. (male) and 30c. (female) in Northern manufacture; 30c. (male) and 27½c. (female) in Southern. Piece work and bonus schemes must produce average earnings equaling the above minima.

Administration of the code is entrusted to the Association of Manufacturers in the Aluminum Industry.

Iron and Steel Exports Decreased in July

Exports of Iron and Steel from the United States

(In Gross Tons)

	July		Seven Months Ended July	
	1933	1932	1933	1932
Pig iron	106	146	1,295	1,670
Ferromanganese	3	5	8	18
Scrap	47,552	23,991	402,906	139,586
Pig iron, ferroalloys and scrap	*47,661*	*24,142*	*404,209*	*141,274*
Ingots, blooms, billets, sheet bar	149	28	904	1,213
Skelp	3,568	1,787	8,230	14,593
Wire rods	1,038	105	7,264	9,333
Semi-finished steel	*4,755*	*1,920*	*16,398*	*25,139*
Steel bars	1,873	820	10,746	10,055
Alloy steel bars	129	247	739	1,158
Iron bars	96	140	300	475
Plates, iron and steel	1,097	868	3,783	7,384
Sheets, galvanized steel	2,958	1,809	17,926	15,781
Sheets, galvanized iron	141	119	545	897
Sheets, black steel	2,151	2,171	14,684	25,500
Sheets, black iron	133	106	977	1,890
Hoops, bands, strip steel	2,721	1,594	11,315	12,758
Tin plate: terne plate	6,276	2,430	30,349	22,002
Structural shapes, plain material	1,299	1,012	5,093	9,822
Structural material, fabricated	927	1,792	7,511	10,468
Tanks, steel	336	115	1,392	1,484
Steel rails	1,576	668	8,677	9,043
Rail fastenings, switches, frogs, etc.	401	295	1,693	2,803
Boiler tubes	217	501	2,115	1,941
Casing and oil-line pipe	1,644	4,485	16,802	12,210
Pipe, black and galvanized, welded steel	3,523	1,860	15,329	15,713
Pipe, black and galvanized, welded iron	159	439	827	2,689
Plain wire	1,526	448	6,137	5,876
Barbed wire and woven wire fencing	2,390	1,169	13,436	11,807
Wire cloth and screening	77	67	373	395
Wire rope	203	133	1,037	971
Wire nails	1,026	935	4,828	4,988
Other nails and tacks	322	235	2,119	2,228
Horseshoes	3	3	57	34
Bolts, nuts, rivets and washers, except track	214	250	1,761	1,626
Rolled and finished steel	*33,418*	*24,711*	*180,551*	*191,998*
Cast iron pipe and fittings	1,127	621	5,320	5,674
Malleable iron screw fittings	212	113	1,142	1,044
Car wheels and axles	142	194	2,333	1,798
Iron castings	254	219	1,328	1,413
Steel castings	178	61	490	830
Forgings	214	258	1,725	2,538
Castings and forgings	*2,127*	*1,466*	*12,338*	*13,297*
All other	350	314	2,083	2,579
Total	88,311	52,553	615,579	374,287

Imports of Iron and Steel Products into the United States

(In Gross Tons)

	July		Seven Months Ended July	
	1933	1932	1933	1932
Pig iron	18,339	673	81,166	75,876
Sponge iron	52	50	272	101
Ferromanganese and Spiegeleisen*	7,252	999	26,699	14,835
Ferrochrome†	....	....	21	119
Ferrosilicon‡	31	4	82	36
Other ferroalloys	....	33	102	672
Scrap	13,391	95	22,875	4,298
Pig iron, ferroalloys and scrap	*39,065*	*1,854*	*131,217*	*95,937*
Steel ingots, blooms, etc.	20	43	371	2,081
Wire rods	1,753	267	7,818	4,190
Semi-finished steel	*1,773*	*310*	*8,189*	*6,271*
Concrete reinforcing bars	122	2,027	1,707	21,415
Hollow steel bars	44	92	517	465
Merchant steel bars	1,605	2,396	10,481	21,502
Iron bars	48	21	243	282
Iron slabs	....	....	1	11
Boiler and other plate	11	42	122	315
Sheets, skelp and saw plate	705	1,187	5,881	11,581
Tin plate	14	15	202	7,206
Structural shapes	2,306	1,966	15,106	19,305
Sheet piling	....	....	94	....
Rails and rail fastenings	2,581	41	3,397	1,858
Welded pipe	475	677	2,150	2,871
Other pipe	166	136	846	1,680
Barbed wire	550	1,254	5,435	9,588
Round iron and steel wire	388	156	1,686	1,351
Flat wire and strip steel	90	567	521	990
Wire rope and strand	115	70	882	1,100
Other wire	126	157	1,004	604
Hoops and bands	1,842	4,188	10,232	15,832
Nails, tacks and staples	339	1,043	3,707	6,314
Bolts, nuts and rivets	22	17	161	98
Other finished steel	56	20	233	60
Rolled and finished steel	*11,605*	*16,072*	*64,608*	*124,428*
Cast iron pipe and fittings	190	176	576	199
Castings and forgings	172	84	693	656
Total	52,805	18,496	205,283	227,491

*Manganese content only.
†Chromium content only.
‡Silicon content only.

WASHINGTON, Aug. 29.—Exports of iron and steel in July declined 24,270 tons to 88,311 gross tons from 102,581 tons in June. In contrast, as announced in THE IRON AGE of Aug. 24, imports increased 18,437 gross tons.

The fall in exports was due to lighter shipments of scrap, the July total being 47,552 tons compared with 64,831 tons in June. Of the July scrap shipments, Japan took 39,843 tons; Italy, 4296 tons, and Canada, 1864 tons.

Exports in the first seven months in the current year rose to 615,579 tons from 374,287 tons in the corresponding period of last year. The gain, however, was almost wholly due to the sharp pickup in the outgoing scrap movement.

The heaviest shipments of finished material in July were made up of tin plate, 6276 tons, of which 3061 tons went to Japan. Of the 2958 tons of galvanized steel sheets exported that month, 1495 tons went to the Philippine Islands and 447 tons went to Colombia.

Sources of American Imports of Iron Ore

(In Gross Tons)

	July		Seven Months Ended July	
	1933	1932	1933	1932
Canada	....	37	....	807
Cuba	33,000	....	88,150	55,000
Chile	21,652	....	21,652	218,492
Spain	196	....	606	49
Sweden	....	....	....	7,037
French Africa	....	....	....	10,000
Russia	17,000	16,900	66,850	114,960
Other countries	9,442	....	39,198	67,746
Total	81,290	16,937	216,456	474,091

United States Imports of Pig Iron by Countries of Shipment

(In Gross Tons)

	July		Seven Months Ended July	
	1933	1932	1933	1932
United Kingdom	140	....	5,140	16,352
British India	3,931	598	32,699	22,504
Germany	....	....	234	135
Netherlands	13,471	50	36,807	35,442
Canada	50	....	1,006	138
France	....	....	....	....
Belgium	....	....	....	200
Norway	500	....	602	102
Sweden	....	25	2,803	422
All others	147	....	1,775	581
Total	18,239	673	81,066	75,876

Steel Is Not a "Recent" Convert To the New Deal

By JOHN H. VAN DEVENTER
Editor, THE IRON AGE

AMERICA'S greatest basic industry, steel, formally received its NRA degree on Aug. 19, when it was handed its code diploma signed by the President. Actually, however, its novitiate of service to the "new deal" began several years before this "new deal" was officially formulated.

It is interesting, in the light of so much popular misinformation regarding the attitude of the industry toward modern social viewpoints, to review a few incontestable facts.

The main purposes of the new deal are two. One of them has to do with the recognition of the right of labor to find opportunity to work and conversely with the obligation of the employer to help labor to find it. The second is the conception of the employer's obligation to pay the highest possible wages, not alone as a stimulus toward bettering the situation of the individual but also as a means of increasing mass buying power and hence of stimulating business.

These are the "two great commandments" of the President's new deal. The attitude of any industry toward this program and all that it implies with respect to the NRA may best be measured and interpreted by its practice of the two commandments. And certainly, no better period could be chosen in which to gage an industry's sincerity of purpose, or lack of it, than the grueling period of the depression.

With regard to the first commandment of the new deal, which relates to the employer's obligation to provide working opportunity for his labor, the steel industry's intent as expressed in its practice has been unmistakable. It was the first industry to spread employment among its workers in the face of declining business. Long before the "spread work" idea was promulgated or official drives instituted to "sell" it to industry, the steel industry had made it a primary policy. And there is no industry in America that can show a more enviable record of employment maintenance in comparison with decline in business volume than the steel industry has made since 1929.

Facts to substantiate this statement are available from all sections of the industry. As an example, the following is cited from an address by Myron C. Taylor of United States Steel Corpn. broadcast over a nation-wide radio hook-up on Jan. 27, 1931.

"Plans were promptly made and a really simple expedient employed that if operations should be substantially lessened, the remaining work would be distributed equitably, as nearly as might be, among all the workers, giving to each a ratable portion of such work as was going; this program to be continued as well as could be done throughout such emergency.

"For the period Jan. 1 to July 1, 1930, the number employed, either on whole or on part time work, was equivalent to an average of 221,123 employed for the entire period, as against an average for the year 1929 of 224,980.

"For the month of December, 1930, the last period for which we have complete reports, there were employed on either full or part time in the various corporation activities 226,614 men. This in a period when operation of the plants was on the basis of only 38 per cent. * * *

"Out of the experience of this year will flow much that is good by way of example and experience and remedy. Until we resume a normal basis of operation it should be the first duty of every individual concerned with the employment of others to see, during this dull period, that the work—whether it be 60 per cent or 70 per cent or 80 per cent or 100 per cent of capacity—is divided equitably among those who are able and willing to work."

So much for the first commandment. How about the second, which is the recognition of the highest possible wage maintenance?

This too, it will be admitted, is best gaged by depression policies. It is much easier to be generous in one's dealings in times of prosperity than when the pocketbook is pinched by the pressure of adversity. In the steel industry, during the depression, wages suffered last. Salaries were slashed to the bone in executive departments and common stock dividends walked the plank in the great majority of steel companies before wage rates were touched. And when mounting deficits and depleted working capital made wage reductions necessary, these were effected with such moderation that the steel industry's wage levels stood in extremely favorable comparison with those of other industries.

It was largely because proof of these facts was made available to the Administration during consideration of the steel code, and because it was clearly evident that the industry was no new convert to the basic principles of the new deal, that the terms of the code, as submitted by the American Iron and Steel Institute, were accepted by the Administrator and the President with substantially no changes in the proposed hours, wages or trade practices.

The steel industry is convinced that the Administration appreciates both its cooperation during code formulation and its forward-looking labor policies during the depression. It believes that it can go forward wholeheartedly with the President in his recovery plan and that no extraneous interests will be permitted to divert it from fullest adherence to the two great commandments.

Gasoline Pump Code Got Speedy Hearing

WASHINGTON, Aug. 29.—Hearing on the code of fair competition for the gasoline pump industry was held last Friday and lasted one hour and forty-five minutes. The code was signed up by 100 per cent of the industry on June 16, the day President Roosevelt signed the Recovery Act. Several amendments to the original code were offered on behalf of the industry by Nelson Talbott, Dayton, Ohio. One changed the maximum work week from 35 to 40-hr. The minimum wage is 40c. an hour.

Machine Tool Builders File Code

Contains Clause Specifying Selection, Retention and Advancement on Merit—Asks for 40-Hour Week, 35 Cent Wage Minimum

THE code of fair competition for the machine tool industry, as prepared by the National Machine Tool Builders' Association, was filed with the Administrator in Washington on Monday of this week.

The terms of the proposed code, which will undergo public hearing at a date to be announced later, are as follows:

To effectuate the policy of Title 1 of the National Industrial Recovery Act, the following provisions are established as a National Industrial Recovery Code for the Machine Tool Industry.

THE INDUSTRY

Art. I—The term "MACHINE TOOL INDUSTRY" as used herein is intended to include all those engaged in the manufacture for sale of machine tools and forging machinery and parts thereof.

"The term 'Machine Tools' includes all power driven, complete metal working machines, not portable by hand, having one or more tool and work holding devices, used for progressively removing metal in the form of chips." The term "Forging Machinery" includes all hot and cold forging machinery, excepting hydraulic machinery.

The term "Parts Thereof" includes all parts for machine tools and forging machinery, jigs and fixtures, and such small tools and accessories as are now or may be made by builders of machine tools and forging machinery.

APPLICANT

Art. II—The applicant for this code is *The National Machine Tool Builders' Association*, a trade organization, all members of which are engaged in such manufacture for sale, and which organization is truly representative of the industry.

This Code is presented by applicant, in association with Machinery and Allied Products Institute.

Applicant organization imposes no inequitable restrictions on membership therein. The code presented by it is not designed to promote monopoly, will not operate to oppress or eliminate small enterprises, will not operate to discriminate against them, and will tend to effectuate the policy of said Title I of the National Industrial Recovery Act.

DEFINITIONS

Art. III—The following terms as used herein, unless otherwise clearly indicated by the context, are defined to have meaning respectively as follows:

"Persons" means a natural person, a partnership, or a corporation.

"Employer" means any person actively engaged in the manufacture for sale of any of the products of the industry.

"Employee" means any one who is employed by any such employer.

"The Act" means the National Industrial Recovery Act, enacted by the Congress of the United States, on June 13, and approved by the President on June 16, 1933.

"The President" means the President of the United States, and any person to whom he has delegated authority under the Act.

"Supervisory Agency" means the applicant organization, or any committee, or section thereof, to whom it has delegated authority.

EFFECTIVE DATE

Art. IV—This Code shall become effective and binding on all persons engaged in the industry on the eleventh day after its approval by the President, and shall not be otherwise effective.

EMPLOYMENT

Art. V—As required by Section 7 (a) of Title I of the National Industrial Recovery Act, the following provisions are conditions of this Code:

"(1) That employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection; (2) that no employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing; and (3) that employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President."

It is also declared, that:

Nothing in this Code shall prevent the selection, retention or advancement of employees on the basis of their individual merit, without regard to their affiliation or non-affiliation with any labor organization, or with any other lawful organization.

Nothing in this Code shall prevent any individual employee from bargaining individually with his employer, if both so desire.

The Industry has recognized the right of the employees of any employer to bargain collectively with such employer, through representatives chosen by such employees from among themselves, without interference, coercion, or restraint from their employer or from anyone.

These principles, long recognized and practiced in the Industry, are in the judgment of employers, in the interest of the employees, and in the opinion of the employers should be maintained and protected.

MINORS

Art. VI—No employer shall employ any person under the age of sixteen years.

WAGES

Art. VII—(a) On and after the effective date the minimum wage that shall be paid by any employer to any employee engaged in the processing of the products of the industry, and in labor operations directly incident thereto, shall be thirty-five (35) cents per hour; unless the rate per hour for the same class of labor on July 15, 1929, was less than thirty-five (35) cents, in which case the rate per hour paid shall be not less than the rate per hour paid on July 15, 1929; and provided, that in no event shall the rate per hour paid be less than thirty (30) cents; and provided, that casual and incidental labor and learners (other than apprentices) may be paid not less than eighty (80) per cent of such minimum wage, but the total amount paid by any employer to such casual and incidental labor and learners at such reduced rate shall not exceed in any calendar month seven and one-half (7½) per cent of the total wages paid by such employer to all process labor.

(b) On and after the effective date, the minimum wage that shall be paid by any employer, to all other employees, shall be at the rate of $14 per week, whether calculated on an hourly, weekly, monthly or piece-work basis, in accordance with the usual custom of the employer; provided, however, that office boys or girls, learners, and casual employees may be paid not less than eighty (80) per cent of such minimum wage, but the total amount paid to such office boys or girls, learners and casual employees at such reduced rate shall not exceed in any calendar month seven and one-half (7½) per cent of the total amount paid by such employer to all employees covered by the provisions of this paragraph (b).

(c) The minimum rates of wages provided in this Article VII shall apply to all employees in all localities, unless the President shall fix for this or a similar industry or industries, a lower rate for particular localities.

(d) Nothing in this Article VII shall apply to, or affect, any employee apprenticed to any employer by an indenture made in pursuance of the laws of any state of the United States, or by a written contract under any apprentice system established and maintained by any employer.

(e) Nothing in this Article VII shall apply to any employee who by reason of physical disability or infirmity is competent for only light employment.

(f) Not later than ninety (90) days after the effective date, each employer in the industry shall report to the President, through Supervisory Agency, the action taken by such employer in adjusting the hourly wage rates for all employees receiving more than the minimum rates provided in paragraph (a) of this Article, but receiving less than $35 per week of regular work period.

HOURS

Art. VIII—On and after the effective date no employer shall employ:

(a) Any employee engaged in the processing of the products of the industry, and in labor operations directly incident thereto, in excess of forty (40) hours per week.

(b) Any other employee, except executives, administrative, supervisory and

technical employees and their respective staffs, and traveling, sales, and service employees, in excess of forty (40) hours per week.

Provided, however, that these limitations shall not apply to conditions of seasonal or peak demand, which create an unusual and temporary burden for production or installation; in such cases such numbers of hours may be worked as are required by the necessities of the situation; but not to exceed forty-eight (48) hours per week for any six weeks in any calendar six months period; *provided, further,* that in such special case, at least time and one-third shall be paid for hours worked in excess of the maximum; *provided, further,* that these limitations shall not apply to employees on emergency, maintenance, and/or repair work, or to very special cases where restrictions of hours of highly skilled workers would unavoidably reduce or delay production; but in any such special case at least time and one-third shall be paid for hours worked in excess of the maximum.

SUPERVISORY AGENCY

Art. IX—The applicant organization, acting by or through any committee, or section thereof, to which it has heretofore delegated authority, is hereby designated the *Supervisory Agency,* for administering, supervising and promoting the performance of the provisions of this code by the members of the industry.

The members of the National Machine Tool Builders' Association and the subscribers to this Code agree to contribute to the Association office figures covering their company's experience, for compilation of industry reports on the following items:

(1) Monthly reports on total volume of new orders, in dollars, classified according to foreign and domestic destinations.

(2) Monthly detail reports classified by types and sizes of machines agreed upon by members of each group, covering unfilled orders, new orders, cancellations, shipments, and stocks on hand; in units.

(3) Monthly reports on wages paid, by classes of labor.

(4) Monthly reports of average hours of employment, by classes of labor.

One copy of each such composite industry report, when compiled, shall be made available to each member of the industry without charge.

It is, however, expressly provided, that the jurisdiction of Supervisory Agency under this Code over any employer, is limited to that portion of the business and employment of such employer which is within the industry.

DATA CONFIDENTIAL

Art. X—Except as otherwise provided in the Act, all statistics, data and information filed in accordance with the provisions of the Code shall be confidential.

The statistics, data and information of one employer shall not be revealed to any other employer, except that, for the purpose of administering or enforcing the provisions of this Code, Supervisory Agency, by its duly authorized representatives (who shall not be in the employ of any employer affected by this Code), shall have access to any and all statistics, data and information, that may be furnished in accordance with the provisions of this Code.

CODE OPEN TO ALL EMPLOYERS

Art. XI—Any employer may participate in any endeavors of applicant in the preparation of any revisions of, or additions or supplements to this Code, by accepting the proper pro rata share of the cost and responsibility of creating and administering it, either by becoming a member of applicant, or by paying to applicant an amount equal to the dues from time to time provided to be paid by a member of applicant in like situation.

ACCOUNTING AND COSTING

Art. XII—As a basis for the determination of a fair price for each unit manufactured and distributed by any manufacturer or his agent, the National Machine Tool Builders' Association agrees to have drawn up a practical system of cost finding, designed to provide sound methods of dealing with cost problems peculiar to the machine tool industry to be used by the industry with such variations therefrom as may be required by the individual conditions affecting any employer or group of employers.

Art. XIII—No employer shall sell or exchange any product of the Industry, manufactured by him, at a price, or upon terms and conditions, which will result in the customer paying for the goods received less than the cost thereof to the seller, determined in accordance with the method of costing above described; *provided, however,* that obsolete product may be disposed of by any employer at a lesser price, but only if such employer, not less than two weeks before such disposal, has filed with Supervisory Agency, for immediate transmittal to all direct competitors, a statement in writing, setting forth an identifying description and quantity of such equipment.

PRICE LISTS

Art. XIV—Every manufacturer shall establish and announce his own prices for his standard product, accessories, and/or attachments, based on consideration of his costs, breadth of the market for that type of product, and utility to the user. Such prices shall then be the list or published prices to be quoted to all customers, whether the product is sold direct by the manufacturer or through his authorized agencies or dealers. These list prices shall remain in effect, and no deviation may be made from them until changes are made as provided in the following paragraph of this Article.

In order to effect changes in list or published prices, and at least 10 days before new prices are intended to become effective, the manufacturer shall file notice of change, including a schedule of new prices, with Supervisory Agency, and at the same time supply Supervisory Agency as many copies as may be required to mail one copy to each member of the directly competitive group.

For a period of 10 days following the date on which the new prices become effective, the manufacturer or his agents or dealers may accept orders on quotations which were outstanding on the date the notice of change was filed.

All quotations for domestic destination shall be made f.o.b. cars at point of manufacture, or if delivered price is quoted, full transportation costs shall be added.

INVESTIGATIONS

Art. XV—Aggregations of employers having a common interest and common problems will be grouped by Supervisory Agency for administrative purposes into various subdivisions, or product classifications.

In each subdivision or product classification there will be a sub-supervisory agency approved, or appointed, by Supervisory Agency. If formal complaint is made to Supervisory Agency that provisions of this Code have been violated by any employer, the proper sub-supervisory agency shall investigate the facts, and to that end may cause such examination or audit to be made as may be deemed necessary, and shall report the results of such investigation and examination to Supervisory Agency.

UNFAIR PRACTICES

Art. XVI—Unfair practices shall be deemed to be practices or acts which by subterfuge, concealment, misrepresentation, or by any form of discrimination, result in selling below published prices, or in deceiving or misleading purchasers, or in misrepresenting the products of competitors. Any such unfair practice is hereby declared to be and to constitute an unfair method of competition.

EXPORT TRADE

Art. XVII—Except as may be subsequently set forth in a specific or supplementary Export Code for the industry, the provisions of this Code now or hereafter adopted with regard to prices, discounts, deductions, allowances, extras, commissions or methods and/or terms of sale, are not to apply to direct export sales or to sales in course of export (i.e., sales destined ultimately for export) or to sales of materials used in the manufacture of products for export. The term "export" shall include in addition to shipments to foreign countries, shipments to such United States possessions as may be defined by the industry.

CHANGES

Art. XVIII—Prior to its approval by the President, applicant may at any time change or modify any provision of this Code (except those provisions required by Sections 7(a) and 10(b) of the Act), or may withdraw this Code.

Any change or modification of this Code, effected by such approval, shall be subject to the consent of applicant, and shall be effective if approved by applicant.

RIGHTS OF PRESIDENT

Art. XIX—As provided by Section 10(b) of the Act, the President may from time to time cancel or modify any order, approval, license, rule or regulation issued under Title I of the Act.

AMENDMENTS CONTEMPLATED

Art. XX—Such of the provisions of this Code as are not required by the Act to be included herein, may, with the approval of the President, be modified or eliminated as changed circumstances or experience may indicate.

This Code is intended to be a basic Code. Study of the trade practices of the industry will be continued by Supervisory Agency with the intention of submitting from time to time additions to, or revisions of, or supplements to, this Code; such additions, such revisions, and such supplements, however, shall conform to and be consistent with the provisions of this Code as now constituted, or hereafter changed.

Any such amendments, additions, revisions, or supplements, proposed by Supervisory Agency, and approved by the President, shall be in full force and effect after such approval.

SEGREGATION OF INDUSTRY

Art. XXI—If any employer of labor in the industry is also an employer of labor in any other industry, the provisions of this Code shall apply to, and affect, only that part of his business and product which is included in this industry.

... PERSONALS ...

WILLIAM G. MATHER, one of the most prominent leaders in the iron and steel, iron ore, pig iron and Lake vessel industries, announced his desire to retire from the presidency of the Cleveland-Cliffs Iron Co., Cleveland, at a meeting of the directors Aug. 24, in order to devote some of his time to travel and leisure. He has served the company and its predecessor 55 years, 42 years of which was as head of the Cleveland-Cliffs company. EDWARD B. GREENE, prominent Cleveland banker, who has been a director and member of the executive committee for several years, was elected to succeed Mr. Mather as president. The change becomes effective Sept. 1. Mr. Mather retains his affiliation with the company and activity in its affairs as chairman of the board, a position just created by the directors. Mr. Greene is chairman of the executive committee and a director of the Cleveland Trust Co., and will retain his official connection with the bank.

Mr. Mathers is also president of the Cliffs Corpn., a holding company controlling the Cleveland-Cliffs Iron Co., and Mr. Greene will succeed him in that capacity. Mr. Mather is chairman of the board of the Corrigan, McKinney Steel Co. and the Otis Steel Co., Cleveland, and served for some time as president of the former company, which is controlled by the Cliffs Corpn.

The Cleveland-Cliffs Iron Co. was established in 1849 by Mr. Mather's father, Samuel L. Mather, as the Cleveland Iron Mining Co. to develop iron ore properties in the Marquette Range in Michigan. In 1891 the company merged with the Iron Cliff Mining Co. and the present name was adopted. William G. Mather, who had become affiliated with the company in 1878, after his graduation from college, succeeded his father when the new company was formed, and under his direction the company became one of the three largest iron ore mining and bulk freight shipping interests on the Great Lakes. Extending his interests the past few years to companies engaged in the manufacture of steel, Mr. Mather acquired a leading position in the iron and steel industry.

Mr. Greene represents a large financial interest in the company and through experience in financial matters, both in the bank and in connection with other large corporations, is regarded as admirably fitted for his new duties, especially in respect to the financial problems which have arisen out of the depression.

Mr. Greene, as well as Mr. Mather, are members of the executive committee of the Republic Steel Corpn. Mr. Greene is a member of the board of directors of a number of other corporations, including the New York Central Railroad, the Goodyear Tire & Rubber Co., the Medusa Portland Cement Co., and the Eaton Mfg. Co. He is a trustee of Yale University and the Cleveland Museum of Art, and is active in other civic as well as charitable institutions.

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JAMES W. OWENS, welding consultant and director of the National Weld Testing Bureau organized recently by the Pittsburgh Testing Laboratory, Pittsburgh, has been prominently identified with the welding field for more than 15 years. During the War he was a member of the Emergency Fleet welding committee. For eight years he was welding aide in charge of welding research and development for the Bureau of Construction and Repair of the United States Navy, and is credited with writing the specifications for the first application of welding to United States cruisers. For more than four years Mr. Owens was director of welding for the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and was instrumental in applying welding to merchant ship construction. Following this Mr. Owens engaged in private consulting practice and served also as director of engineering of the Welding Engineering & Research Corpn., New York.

One of the organizers of the American Welding Society, Mr. Owens has served as vice-president and is at present a director. In addition, he is chairman of the nomenclature committee and is a member of several other technical committees of the A. W. S. and other societies in which he holds active membership. Mr. Owens was awarded the Samuel Wylie Miller Memorial Medal for 1929 and was awarded the first prize of $10,000 in the Lincoln Electric Co. prize competition of 1928. He is the author of many articles for technical magazines, as well as of a book on "Fundamentals of Welding—Gas, Arc and Thermit."

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GEORGE H. CORLISS has been named sales promotion and advertising manager of the Lewis-Shepard Co., Boston, and will have charge of merchandising the company's line of factory and warehouse material handling equipment. He has recently been identified with the J. A. Fay & Egan Co., Cincinnati, and the Kewaunee Mfg. Co., Kewaunee, Wis., and prior to 1930 was associated with the S. A. Woods Machine Co., Boston.

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ROBERT E. SHERLOCK, formerly metallurgist at the Donner plant of the Republic Steel Corpn., Buffalo, has become associated with the Alloy Steel Division of the Youngstown Sheet & Tube Co., Indiana Harbor, Ind.

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CHARLES H. GARITY has been appointed director of purchases and procurement by the Tennessee Valley Authority. He served in the general supplies division of the Quartermaster Corps during the World War, and terminated his service with the rank of captain. Subsequently he became associated with Sweet's Catalogue of Engineering and Dodge Reports, American Wholesale Corpn. of Baltimore, and more recently was connected with Arundel Corpn. as purchasing agent and office manager on the Safe Harbor, Pa., hydro-electric project.

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H. E. EWART has been appointed Pittsburgh district representative of the Bantam Ball Bearing Co., South Bend, Ind. He was formerly chief engineer of United Engineering &

E. B. GREENE

W. C. MATHER

J. W. OWENS

Foundry Co., Pittsburgh, prior to which time he was connected with the Tennessee Coal, Iron & Railroad Co., Birmingham. In his new capacity Mr. Ewart will be located in Pittsburgh and will represent his company on steel mill and industrial bearing applications.

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LEO I. SMITH has been appointed New England district representative by Roots - Connersville - Wilbraham, Connersville, Ind., manufacturer of blowers, gas exhausters and meters, liquid and vacuum pumps and inert gas machines. Mr. Smith received his technical training at Franklin Union and Lowell Institute in Boston and upon graduation was connected with B. F. Sturtevant & Co. He was subsequently employed by Semet-Solvay Co. and the Parker Russell Mining & Mfg. Co. in sales and engineering work.

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F. F. BRAND has been made assistant to the manager of the Pittsfield, Mass., works of the General Electric Co. and will be in charge of engineering. Mr. Brand is a native of Sussex, England, and was educated in that country. He went to Pittsfield as a student engineer at the former Stanley Electric Mfg. Co., and in succeeding years worked up through the engineering department to executive engineer of the power transformer engineering department.

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I. H. SCLATER has been made engineer in charge of the power transformer engineering department of the General Electric Co., Pittsfield, Mass. Mr. Sclater, who has been assistant engineer of this department, is a native of Palmyra, Va., and was educated at the Virginia Polytechnic Institute. He became associated with the General Electric Co. in 1906, was transferred to the Pittsfield distribution transformer department in 1913, became head of that department in 1916, and subsequently took up instrument as well as power transformer design.

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HARVEY B. BOWER, for 10 years representative of the L. S. Starrett Co., precision instruments, Athol, Mass., with headquarters in Milwaukee, has resigned to become Chicago district manager of the National Twist Drill & Tool Corpn., Detroit, with offices at 1144 Washington Boulevard, Chicago.

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E. D. CAMPBELL has been promoted to the post of assistant general mechanical engineer of Americah Car & Foundry Co., effective Sept. 1. His headquarters will be at Berwick, Pa., where he becomes second in command to V. R. Willoughby, general mechanical engineer of A. C. F.

Since Feb. 1, 1920, Mr. Campbell has been in charge of the A. C. F. engineering department at St. Louis. His promotion occurs in connection with the further concentration of A. C. F. engineering activities at the Berwick plant. Before it was undertaken some time ago, considerable study was given to the redistribution of the engineering personnel, and subsequent events have proved that the new arrangement is a most satisfactory one.

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ALLEN W. CLARKE, mechanical engineer, has been transferred, effective the same date, to take charge of the St. Louis branch of the engineering section, with headquarters at St. Charles, Mo.

The maintenance of a branch of the engineering section in the St. Louis district permits close engineering contacts with the railroads in the western territory.

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V. R. WILLOUGHBY, general mechanical engineer, will continue to divide his time between the general offices in New York and the Berwick branch of the engineering section.

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L. A. PEASE, for 25 years associated with the engineering staff, Fairbanks, Morse & Co., at its main works in Beloit, Wis., has resigned to become maintenance engineer, A. O. Smith Corpn., Milwaukee.

OBITUARY

ROY L. SANFORD, widely known executive for A. M. Castle & Co., died at his home in San Francisco, Calif., on Aug. 13. He first became identified with the iron and steel industry in 1898, when he became associated with the McAllenan Boiler Co., Peoria, Ill. From 1903 to 1907 he traveled out of the Chicago office of A. M. Castle & Co., and in 1907 he was placed in charge of the company's operations in San Francisco. Later when warehouses were opened at Los Angeles and Seattle he was made senior vice-president and San Francisco resident manager.

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KIRK S. KYLE, manager of employment, Fafnir Bearing Co., New Britain, Conn., for the past 17 years, died in that city on Aug. 16, of heart trouble. He was born in South Windham, Me., 46 years ago.

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EDWARD I. HEINSOHN, formerly identified with the metal-working industries in Cleveland, died in that city Aug. 22, aged 57 years. In 1911 he organized the Cleveland Welding & Mfg. Co., now the Cleveland Welding Co., for the manufacture of automobile rims and other work in the welding field, and was president and general manager of that company until 1918. From 1922 to 1927 he was president of the Glascote Co., Cleveland, manufacturer of glass-lined tanks. He severed his connection with the company in the latter year because of ill health and had not since been actively engaged.

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W. D. TYNES, president of the Hardie-Tynes Mfg. Co., Birmingham, died Aug. 19 at the age of 70 after a brief illness. Thirty-five years ago Mr. Tynes went to Birmingham and, with an associate, organized the present company, which during the past 15 years had developed an international business in equipment, particularly engines, compressors, hoists, etc.

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CHARLES WHITMAN GATES, for 31 years purchasing agent, United Shoe Machinery Corpn., Boston, died at his home in Beverly, Mass., Aug. 23. A native of Nova Scotia, he was 73 years of age.

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OTIS JAY CESSNA, for many years connected with the sales department of the Albion Malleable Iron Co., Albion, Mich., died at his home in that city on Aug. 20. He was born at Kalamo, Mich., in 1874, and, in 1894, joined the staff of the Advance Thresher Co., now the Advance-Rumley Co. In 1914 he became associated with the Albion company.

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J. C. CORTICK, president of the Cortick Mfg. Co., died at his home in San Francisco on Aug. 15. He had been engaged in the pole line hardware business in that city for a number of years.

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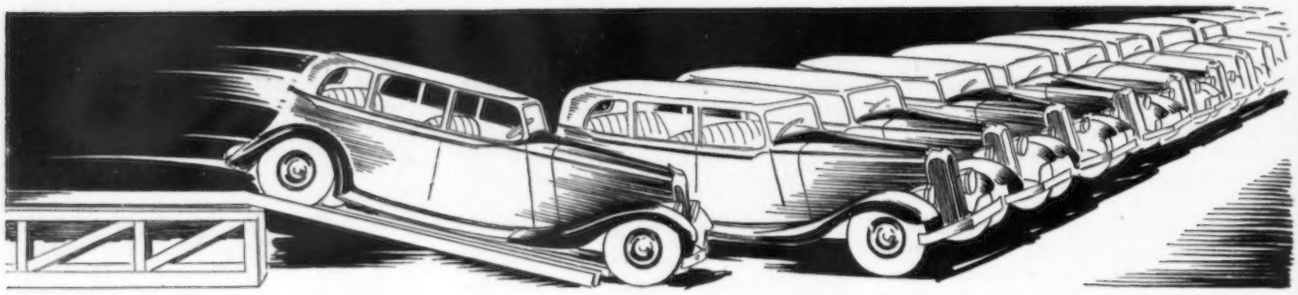
ARTHUR POWELL DAVIS, for 21 years director and chief engineer of the United States Reclamation Service, died at his home in Oakland, Cal., on Aug. 7. During his connection with the service he explored the route for the proposed Nicaraguan Canal and later played a part in the Panama Canal project, as well as the Boulder and Coolidge dam projects. Only recently he was appointed a consulting engineer on the Boulder Dam project, the first surveys for which were made under his direction.

The General Electric Co. and four of its associated companies have removed their offices in New York to the new General Electric Building, 570 Lexington Ave. Included are the executive offices, New York district office, air conditioning department, electric refrigeration department, Atlantic division of the incandescent lamp department, merchandise department, and plastics department of the company. New York headquarters were formerly at 120 Broadway.



▲▲▲ THIS WEEK ON THE ASSEMBLY LINE ▲▲▲

Car Sales Hold at Recent High Levels

DETROIT, Aug. 29.

DESPITE the fact that the selling season is well advanced and demand at this time of the year usually is languishing, motor car sales have been of sufficient volume to compel several manufacturers to accelerate production since the middle of the month. Chevrolet and Hudson-Essex materially increased their schedules more than a week ago. Plymouth likewise stepped up its August output from 25,000 to 30,000 units and in the past few days has again boosted its operations, with 33,758 units as the month's goal. This is about 2000 more cars than Plymouth made in July. The Dodge division of the Chrysler Corpn. is understood to be building 15,000 cars this month, compared with a slightly smaller number in July. It is now estimated that General Motors, Ford and Chrysler are assembling in August about 190,000 units, so that the industry as a whole will go far beyond the 200,000 mark for the month.

September looks more promising than it did a few weeks ago, so far as retail sales are concerned. Increased purchasing power by consumers generally as a result of the N. R. A. program and of higher prices for farm products, the threat of increased automobile prices in the near future and the return of confidence are factors counted upon to sustain retail buying at or near the current level. John W. Scoville, Chrysler's chief statistician, predicts that fall business will be good because of an "expected increase of sales to farmers and the relative prosperity of the South." He reports further that the gain in motor car buying is not localized, but is spread through nearly all sections of the country. Although September production will be guided solely by the trend of retail sales, a total of 175,000 units will not surprise the industry. This would compare with 86,483 units in September of 1932. The Chrysler Corpn. is of the opinion that new passenger car sales for the entire current year will be 1,500,000 units. Reflecting the perpetual optimism of the industry, it goes a step further by predicting that "if prosperity returns, the automobile industry will come back faster and farther than most other lines. A four-million-car year is probably not far distant."

G. M. Busy on New Models

General Motors is the most active company in the preparation of new models, although it is understood that it has no intention of introducing them until near the end of the year. It has made purchases of strip steel for its first production run on standard parts which are not subject to change and has bought sheets for experimental die work. Chrysler is not yet ready to place steel orders for new models. Ford is reported to have given releases for sheets for September delivery. Ford incidentally is enjoying a particularly brisk demand for its V-eight car and its schedule for next month calls for a larger production than in August, which is estimated at 57,000 cars. Ford has been ready for some time to launch its model 44 car, but is said to regard the present season as unpropitious for its introduction. Probably the main reason for its postponement is the satisfactory rate of business being done with its present car.

The imminence of higher steel prices under the code already is driving in some business from the automobile industry, although almost all of it is in strip and sheets. The tonnage booked the past week in strip steel showed a substantial improvement over the previous week. Heavier products have not enjoyed this expansion in orders. They were specified in large volume at the end of June and July, and this month fresh releases have been light. Ordinarily orders are given to the mills in the last 10 days of August to cover September requirements, but thus far they have been of small volume. This confirms the impression that the leading automobile makers bought heavily 30 days ago not only for immediate requirements, but also to increase their banks of finished parts, especially of forgings, and of steel. Bar mills and suppliers of other heavy steel products do not look for much buying on the part of the automobile industry until at least late in September. It is believed that motor car companies would take greater advantage of the opportunity to purchase steel ahead at present prices were it not for the fact that they do not know what their needs for certain models will be. They are not in a mood to gamble, except on what appears to be a sure thing.

One Price Steel Policy to Hold

UNDER the steel code the automobile industry has no recourse from its obligation to pay the same price as any other steel consumer. This already is causing much squirming by purchasing departments accustomed to obtaining concessions, but for the first time the steel people have an enforcing agency ready to see that chiseling plays no part in their relations with big steel users. Automobile manufacturers are so accustomed to special privileges that they cannot yet realize that their favorite game of playing one supplier against another is at an end. That they will attempt serious resistance to the price provisions of the steel code, which they have vigorously opposed, seems remote, largely because there is nothing they can do except bow to the inevitable.

While the automotive industry is resigning itself to the payment of higher steel prices, it is not relaxing its efforts to secure parts at low con-

tract rates. A leading company has put out inquiries for prices on small forgings and other parts covering its requirements from Oct. 1 to July 1, 1934. In view of the uncertain factors surrounding steel prices during that period, suppliers must guess at materials costs in making their bids. At least one company, which now has a sizable contract with this automobile maker and expects to get its share of the new business, is counting on buying probably six months' steel needs in case steel prices advance.

Pig iron as well as steel prices are a subject of concern to automobile companies operating foundries. They have always been able to purchase large tonnages under the market schedule and have made further economies by providing facilities for water delivery. The Chevrolet Motor Co. is believed to have spent approximately a million dollars for its dock and equipment at its Saginaw, Mich., foundry and the Federal Government has expended large sums in making the channel at Saginaw navigable. Any move which would destroy or impair this advantage would not be considered an equitable arrangement, since it would deprive the Chevrolet company of not only cheap transportation, but also its preferential treatment as a large pig iron user. It is pointed out in the pig iron trade, however, that Chevrolet will have just as much of an advantage under the code as before it existed. It will be able to buy pig iron at the base price at Detroit plus the water transportation rate to Saginaw. This is a lower delivered price than having a contract price under the regular market at Buffalo plus the water rate to Saginaw.

Detroit Notes

Chevrolet sales representatives, in Detroit last week for a regional conference, are said to have been shown the chassis for the 1934 car. The wheelbase will be longer than this year. Motor changes will not be radical, being confined to increasing the power somewhat. The front-end design still is the most daring departure from the conventional . . . Packard will be the first company out with a 1934 line. Dealers' stocks already are being shipped by the factory . . . Some motor car companies are understood to have refused to revise upward current parts contracts with suppliers whose costs had been increased by subscribing voluntarily to the N. R. A. program . . . Foundries engaged in making castings for the Chrysler Corpn. are very busy, indicating good production by the Chrysler units in September. Chrysler's assemblies this month will be about 52,000 cars. . . Studebaker is said to be considering dropping its Rockne line and substituting a small six to be marketed under the Studebaker name. . . Ford is reported to be considering for its cars a window ventilating system with a single ratchet which controls both the window and the ventilation. . . An eastern banking group, supported by Pierce-Arrow officials, is negotiating for the purchase of the Pierce-Arrow Motor Car Co. from the Studebaker Corpn. . . Plymouth's sales for the week ended Aug. 19 total 7,005 cars.

He Is and Will Be A Busy Man

G. H. CHARLS, secretary of American Iron and Steel Institute, will have charge of the many details of price administration under the terms of the steel code.

George Herbert Charls, steel executive, was born in Cincinnati, May 27, 1878, a son of George Henry and Elizabeth (Luckey) Charls. He was vice-president, American Rolling Mill Co., 1901-18; vice-president and general manager, Berger Manufacturing Co. and Stark Rolling Mill Co., 1918-21; general manager and president, United Alloy Steel Corpn., 1921-26; president, Hiner Structural Steel Co., commissioner of Hot Rolled Strip Steel Institute, 1927-1928; president, National Association, Flat Rolled Steel Manufacturers, 1928-32; assistant to president and secretary, American Iron and Steel Institute, 1932.

G. H. CHARLS

Production of automobiles in Canada during July totaled 6,540 units as compared with 7,323 in June and 7,472 cars in July, 1932. Apparent consumption of cars in Canada during the month amounted to 4,743 cars. For the seven months ended July 31, 44,802 cars were produced in Canada, 1,110 were imported and 10,504 exported.

Malleable Society Alters Code Terms

MALLEABLE FOUNDERS' SOCIETY acting on behalf of the entire malleable foundry industry of the United States has received from the P.R.A. policy board authorization to substitute for paragraph 3 of the President's Reemployment Agreement the following:

"Factory or mechanical workers or artisans shall not be employed more than 40 hours per week, nor more than 10 hours per day."

With reference to minimum wages as set forth in the President's agreement, malleable founders are privileged to substitute from the malleable foundry code the following:

"Factory or mechanical workers or artisans shall receive not less than 40c. per hour unless the hourly rate for the same class of work on July 15, 1929, was less than 40c. per hour, in which latter case not to pay less than the hourly rate on July 15, 1929, and in no event less than 30c. per hour; provided, however, such employees shall receive not less than 25c. per hour in the southern area of the United States, which is defined as the states of Virginia, Kentucky, Tennessee, Mississippi, North Carolina, South Carolina, Georgia, Alabama and Florida. It is agreed that this paragraph establishes guaranteed minimum rates of pay regardless of whether employee is compensated on basis of time rate or piece work performance."

Steel Furniture Down in July

WASHINGTON, Aug. 26.—Orders for business steel furniture declined to a value of $606,876 in July from $685,989 in June, according to reports made by manufacturers to the Bureau of the Census. In the first seven months of 1933 orders aggregated $3,704,344, compared with $5,044,154 in the corresponding period of last year. Steel shelving furniture orders in July were valued at $180,245 against $178,007 in June. In the first seven months of the current year, orders for this class of steel furniture were valued at $1,053,168 compared with $1,388,429 in the corresponding period of last year.

International Nickel Co., of Canada, Ltd., in the second quarter had net operating income of $2,941,092. Net profit for the period was $1,943,047, after provision for taxes, interest, depreciation, depletion and other reserves, equivalent to 10c. a share on common stock, after preferred dividends.

THIS WEEK IN WASHINGTON

"Open Shop" and "Closed Shop" Banished from NRA Lexicon

By L. W. MOFFETT
Resident Washington Editor, The Iron Age

WASHINGTON, Aug. 29.—Now that General Hugh S. Johnson, National Administrator, has officially removed the words "open shop" and "closed shop" from the lexicon of the National Recovery Administration these terms are obsolutely "verboten" in codes. The general for some time saw that interpretation of Section 7 of the Recovery Act was inevitable. This section covers the labor provision permitting employees to bargain collectively through representatives of their own choosing. It is an organized labor section. Organized labor has played it for all it is worth, if not more, for there are probably in the ranks of organized labor those who think labor disturbances now prevalent come largely from agitation among workers that this section means that workers must join organized labor unions. General Johnson has repeatedly fought misuse of this section by both organized labor and company union groups and the difficulties over the section became so acute that clarification of the section became essential. It was an issue at point in the steel code but was removed when the open shop declaration was withdrawn at the hearing.

General Johnson's banning of the words "open shop" and "closed shop" is said to have been determined upon after he had consulted with general counsel Donald Richberg of the N.R.A. The attitude toward the open shop and closed shop issue was made known by General Johnson in a radio address last Wednesday night.

The text of his statement on the subject is as follows:

"The plain meaning of Section 7 (a) cannot be changed by any interpretation by anyone. It is the function of the Administrator and the courts to apply and to interpret the law in its administration; and no one else can assume this function and no official interpretation can be circumscribed, affected or foreclosed by anyone writing his own interpretation into any code or agreement. Such an interpretation has no place there and cannot be permitted.

"The words 'open shop' and 'closed shop' are not used in the law and cannot be written into the law.

"These words have no agreed meaning and will be erased from the dictionary of the N. R. A.

"The law requires in codes and agreements that 'employees shall have the right to organize and bargain collectively through representatives of their own choosing.'

"This can mean only one thing, which is that employees can choose anyone they desire to represent them, or they can choose to represent themselves. Employers likewise can make collective bargains with organized employees, or individual agreements with those who choose to act individually; provided, of course, that no such collective or individual agreement is in violation of any State or Federal law. But neither employers or employees are required, by law, to agree to any particular contract, whether proposed as an individual or collective agreement.

"The law provides that employees shall be free from the interference, restraint or coercion of employers in the exercise of their rights established by the law. The conduct of employers which is here prohibited has been defined by the Supreme Court in the case entitled—T. & N. O. R. R. v. Brotherhood of Railway Clerks, 281 U. S. 548. The rulings of the Supreme Court lay down the law which governs the N. R. A.

"Under Section 7 (a), employers are forbidden to require 'as a condition of employment' that an employee shall either 'join a company union' or 'refrain from joining, organizing, or assisting a labor organization of his own choosing.' The law does not prohibit the existence of a local labor organization, which may be called a company union and is composed only of the employees of one company. But it does prohibit an employer from requiring, as a condition of employment, that any employee join a company union and it prohibits the maintenance of a company union, or any other labor organization, by the interference, restraint or coercion of an employer.

"If there is any dispute in a particular case over who are the representatives of the employees of their own choosing, the N. R. A. will offer its services to conduct an impartial investigation and, if necessary, a secret ballot to settle the question.

"The N. R. A. will not undertake in any instance to decide that a particular contract should be made, or should not be made between lawful representatives of employees and employers; or to decide that a contract which has been lawfully made should not be enforced.

"Cooperation in all industrial relations depends largely on the making and maintenance of agreements. The N. R. A. will promote and aid such cooperation."

Copies of Steel Code

COPIES of the Steel Code, as originally submitted and as printed in full in The Iron Age of July 20 and the revisions thereto as approved by the President, are available for distribution without charge to our subscribers. Please address the editor.

Government Contracts Cannot Adjust for Higher Costs

WASHINGTON, Aug. 29.—The President's Reemployment Agreement carries a provision for adjusting contracts "to meet any increase in cost caused by the seller having signed this President's Reemployment Agreement or having become bound by any code of fair competition approved by the President." This provision is carried in a number of permanent codes. Fixed prices at which goods were purchased before the National Recovery Act became effective on June 16 for subsequent delivery are being adjusted upward so as to compensate the seller whose code operations have increased his costs. This practice is being adopted at the suggestion of the Government through the National Recovery Administration.

But a contract with the Government is a contract. Inconsistent, as it so often is, the Government cannot make allowance on contracts to cover increased costs of private producers in filling Government contracts.

A formal opinion to this effect has been given by Controller General McCarl. The controller general held that Government contracts must be fulfilled under their original terms even though a plant engaged on a Government contract faces increased costs by reason of a code of fair competition. The opinion of the controller general was asked, interestingly enough, by Attorney General Cummings, who ordinarily is a maker of opinions.

The case concerned that of the Delta Finishing Co., Philadelphia. The Philadelphia concern informed the Government that it was unable to complete a contract for bleaching and shrinking duck manufactured in Atlanta prison. The Philadelphia company had a contract rate of 2⅝c per yard. It declared it would have to increase the cost about 35 per cent because it was operating under the Industrial Recovery Act.

There is no legal authority, the controller general advised the attorney general, for modifying the contract.

"The contract between the United States and the Delta Finishing Co. constitutes an obligation binding on the company and it may not withdraw therefrom without resulting liability to the United States for excess cost, if any, which may be occasioned the Government by such default," said the controller general.

The cost to the Delta company over the original contract price was estimated at $2600.

Many concerns under either the blanket code or permanent codes are having the same experience as the Philadelphia company had. The case calls attention to the fact that when the Recovery Act was before Congress, President Roosevelt said that doubtless the next Congress would have to enact legislation affording protection to contractors to offset increased costs arising from code operations on Government work.

Copper Smelters' Code Is Filed

WASHINGTON, Aug. 29.—The Copper Custom Smelters and Refineries Association of the United States has filed a code of fair competition with the National Recovery Administration which provides for a 40-hr. week when averaged over the period from the effective date of the code until Oct. 1, 1933, or over any of the successive 13 weeks. The minimum wage is fixed at 35c. per hour unless on July 15, 1929, it was less than that rate, in which case it shall be not less than 30c.

Power Piping Code Asks 40 Hours

WASHINGTON, Aug. 29.—A maximum week of 40 hr. and a minimum rate of 40c. an hour are provided for factory employees in a code of fair competition filed with the National Recovery Administration by the Power Piping Society. The code sets up an Emergency National Committee to consist of the members of the executive committee of the Society and its executive director to act as the general planning and coordinating agency for the industry. Regulations cover a list of practices which would be held to be unfair and for which penalties are provided.

Brass Products Code Hearings This Week

WASHINGTON, Aug. 29.—Hearings will be held on Thursday of the present week on a code of fair competition submitted to the National Recovery Administration by the copper and brass mill products industry. The hearings will be in charge of Deputy Administrator H. O. King and will be held in the Senate building caucus room. As provided in the code minimum wages for male employees over 18 years shall be 35c. an hour and female employees 18 years and over shall receive 30c. an hour. The minimum wage for employees between 16 and 18 years shall be "not less than 80 per cent of the minimum." Maximum hours are set at 40 per week except outside salesmen, executive and supervisory staffs. The executive committee of the copper and brass mill products association is set up to cooperate with the President as a planning and fair practice agency for the industry.

Gas Gaining as Marine Motivation

WASHINGTON, Aug. 29.—A growing popularity in the motor driven vessels and a corresponding decline in the number of steam vessels are indicated in the records of the statistical section of the Bureau of Navigation and Steamboat Inspection of the Department of Commerce. A statement by Assistant Director A. J. Tyrer points out that in the 10-year period ended June 30, 1933, the number of documented motor vessels in trade increased from 10,886 to 12,706, an increase of slightly more than 16 per cent in the number of vessels and 171 per cent in tonnage. The tonnage increased from 395,561 to 1,074,585 gross tons. In the same period, the number of steam vessels fell from 8060 vessels of 15,425,840 gross tons to 5476 vessels of 11,787,655 gross tons, a decrease of 32 per cent in vessels and 23 per cent in tonnage. During the same period the number of small undocumented motor boats numbered and recorded has increased from 173,307 to 281,443.

Scrap Institute Code Is Modified

WASHINGTON, Aug. 29.—The code of fair competition of the Scrap Iron and Steel Institute has been modified so as to provide for a 40-hr. week maximum working period for other than factory, mechanical workers and artisans and outside classification. Truck drivers shall not be employed more than 48-hr. For factory workers and similar classifications provision is made for a 40-hr. week with 10 per cent tolerance for crane operators, engineers and others.

Steel Plate Industry Modifies Agreement

WASHINGTON, Aug. 29.—The steel plate fabricating industry has modified its President's Reemployment Agreement, with the approval of the National Recovery Administration, so as to establish a 40-hour week at 40c. an hour.

Foreign Trade Promotion Goes to State Department

WASHINGTON, Aug. 29.—Promotion of foreign trade has been turned over to the State Department. Heretofore the function of the Department of Commerce, this sharp reversal in policy was reached through an agreement announced last Friday in a joint statement by Acting Secretary of State Phillips and Secretary of Commerce Roper. It was stated that the purpose of the change is to effect economies and to avoid duplication. The far-flung foreign trade promotion activities which former President Hoover developed both as Secretary of Commerce and Chief Executive have been greatly curtailed. Supervision over commercial attaches and trade commissioners remains in the hands of the Department of Commerce but they will report directly to the State Department. While general information for American exporters will continue to be supplied by the Bureau of Foreign Commerce, the more detailed and elaborate services heretofore given to them will no longer be furnished.

The joint statement said that both Mr. Phillips and Mr. Roper had agreed that the new policy will place the State Department and the Department of Commerce in the foreign field in a position "more effectively to discharge their major functions of providing information of primary interest to the government and to the American people as a whole."

The new policy provides for coordination of activities of the State Department and Department of Commerce in foreign services by transmission of all instructions from Secretary Roper to field offices of commercial attaches and trade commissioners through Secretary of State Hull. Also reports made by Commerce Department foreign agents will be forwarded by Secretary Hull to Secretary Roper, as will reports of consular agents of the Department of State. The practice of assisting individual firms engaged in foreign trade has been abandoned. The change in policy was made at the direction of President Roosevelt.

Personal Service to Be Dropped

"It is contemplated by this agreement," the joint statement said, "that the commercial attaches will have the primary responsibility for the general economic reporting for the Department of Commerce in countries in which such officials are stationed and by means of weekly conferences to be held by the chiefs of mission under the terms of the new coordination agreement duplication of activity in this field will be avoided. The consular officers of the Department of State will assist the commercial attaches by providing such information as may be required relating to economic conditions and matters affecting the development of American foreign trade in their several districts."

Abandonment of the service by which individual firms were supplied foreign trade information was decided upon, according to the statement because, "It is felt that our exporters are now sufficiently familiar with the details of foreign trading to be able to obtain, without specialized individual aid from the Government agencies, their proper share of world trade."

The specific classes of service to be abandoned, as announced in the joint statement, are:

Special market surveys for individual firms, involving the compilation of data which are not readily available.

Negotiations or transactions in behalf of an individual firm, such as

Actual sale of merchandise.

Conclusion of an agency agreement.

Collection of an account.

Settlement of a trade dispute in which the public interest is not unquestionably involved.

Correspondence or personal interviews in behalf of a firm that is negotiating with a foreign agent or buyer.

Textile Code Hearing Sets Speed Record

WASHINGTON, Aug. 29.—Lasting only three quarters of an hour, hearing on the code of fair competition for the textile machinery industry is so far the shortest one held. It took place last Friday before Deputy Administrator Malcolm Muir who thanked the industry for the unanimity which made it possible to dispose of the hearing so quickly.

The code was submitted by the National Association of Textile Machinery Manufacturers, and provides a minimum hourly rate of 35c for common labor, unless below that rate on July 15, 1929, in which event it shall not be less than 30c.

With exceptions providing for adjustment in special cases, the workweek is fixed at 40-hr. The board of directors of the association is designated as the agency for administering the code. Under the trade practice rules it is provided that no builder of textile machinery shall sell or exchange in the United States market, except in fulfilment of contracts made before Aug. 1, 1933, any new product at a price, or upon terms or conditions, at less than cost. Sale of copied or duplicated machinery and parts is made a violation, as are secret rebates. All sales are to be made f. o. b. factory and the purchase price is made payable 30 days from the date of shipment. In cases of deferred payments, the initial payment shall be not less than 25 per cent of the purchase price, to be made 30 days from the date of shipment, the remainder to be paid over a period not in excess of two years following the average date of shipments. An interest rate of 5 per cent is provided for deferred payments and stocks or bonds will not be accepted.

The demands of labor, speaking through Richard S. Newham of the International Association of Machinists, are for a 30-hr. week, with minimum wages of $25 for unskilled labor and $48 a week for machinists. Because of the exceptions to both the hour and wage provisions and as a result of tentative objections on the part of Labor Adviser Fred Hewitt, Deputy Muir appointed a committee to confer on the matter immediately with a view to possible changes more favorable to the labor point of view.

It was developed at the hearing that the textile machinery industry has more than doubled the number of its employees since the signing of the cotton textile code, having 18,290 workers now as compared with fewer than 9000 a few months ago. Unemployment within the industry has been more than absorbed, according to figures given by B. H. Bristow, Hopedale, Mass., chairman of the code committee. He said the number of employees was 18,251 in 1929 and 16,000 in 1928. Mr. Draper said that under code operation the industry would add 20 per cent more employees if 1929 production levels returned. He stated that the industry is now working 40-hr. In reply to a question by Mr. Hewitt as to how the same hours under the code would increase employment, Mr. Draper declared that the increase would come through a larger volume of business. Mr. Draper said wages for unkilled labor were 42c in 1929 and 35c in the second quarter of 1933, while wages for skilled workers were 55c in 1929 and 49c in the second quarter of 1933.

He said that 19 firms, constituting 60 per cent of the industry, had total sales of $42,798,000 in 1929 and $23,876,000 in 1931.

An amendment by Mr. Draper makes it possible for accessory manufacturers to come under the code if they choose. It is expected they will do so.

Waste Dealers' Code Submitted

WASHINGTON, Aug. 29.—The code of fair competition submitted to the National Recovery Administration by the National Association of Waste Dealers, Inc., provides for a 40-hr. week at an hourly wage rate of 37½c. in the North and 27c. in the South for iron and steel scrap yards. The code proposes administration by the Board of Directors of the Association and recommends that business be done on the basis of sealed bids. It is also proposed that the producer shall be governed by provisions of the code when he sells material direct to the ultimate consumer rather than through a dealer. Disapproval is given in the proposed code of reciprocal arrangements between producers and consumers. It also proposes that no charitable organization shall engage in handling waste material unless it is donated and sold through the Waste Dealers' Association or unless the charitable organization handling the material complies with wage schedules and other terms of the code.

The code sets up a trade relations committee to cooperate with consumers of waste materials and proposes arbitration of disputes through the American Arbitration Association. The code carries a long list of trade practice rules.

July Automobile Production 233,088

WASHINGTON, Aug. 29.—The production of motor vehicles in the United States in July declined to 233,088 units from 253,322 in June. The passenger car output dropped to 195,019 from 211,448 and truck production fell to 38,065 from 41,839. In the first seven months of the current year motor vehicles produced totaled 1,240,198 compared with 1,370,678 in the corresponding period of last year. The passenger car output was 1,042,936 compared with 1,134,372 and the truck production was 195,941 against 235,187.

The Canadian motor vehicle production in July was 6540 compared with 7323 in June.

Construction Code Hearing Set for Sept. 6

WASHINGTON, Aug. 29.—Hearings will begin on Sept. 6 before Deputy Administrator Malcolm Muir on the code of fair competition submitted by the Construction League of the United States. It is stated that 3,000,000 wage earners now actually at work will be immediately affected by the code, which is designed to serve as a master code for the numerous groups within the construction industry. Within a comparatively short time as a result of the public works program estimates have been made that at least 5,000,000 persons will be at work on construction projects and on the production of materials and equipment for such projects.

The minimum wage and maximum hour provisions of the code cover both "white collar" employees and manual labor, allowing the former class a minimum wage ranging from $12 to $15 per week, scaled according to the population of the trade area where the work is performed, with a maximum work week of 40-hr. The minimum rate for manual labor is set at 40c per hour unless the hourly rate on July 15, 1929, was lower, in which case it shall not be less than 30c. Manual labor would not be employed in excess of a maximum of 35-hr. per week during a six months' calendar period, nor more than 48 hr. in any one week or 8-hr. in any one day.

The code represents the first instance of an industry so diversified attempting to set up a basic code. It is pointed out in the code that the essence of the success of the new plan lies in the central coordinating authority to be known as the National Administrative Committee which will include three non-voting members appointed by the National Recovery Administrator.

Code for Special Railway Track

WASHINGTON, Aug. 29.—Submitted to the National Recovery Administration by the Manganese Track Society, the code of fair competition for the railway special track equipment industry carries administrative provisions similar to those of the steel code. It provides that wages shall be at least 15 per cent greater than those prevailing on July 14, 1933, and that unless the code is amended to that effect there shall be no new construction for the production of railroad special track equipment.

Administration of the code is put under the direction of the Board of Directors of the Society to whose secretary reports shall be made concerning production, shipments, sales, unfilled orders, hours of labor, rates of pay and other information. Five wage district groups are set up with minimum hourly rates ranging from 40c. for group 1 down to 30c. for group five. District one includes Chicago, Cleveland, Colorado, Detroit-Toledo, Pittsburgh, North Ohio river and Youngstown valleys. Group two, carrying a rate of 38c., includes Buffalo and Seattle; group three, carrying a rate of 37c., Canton, Massillon and Mansfield, O.; Duluth, Minn.; Indiana - Illinois-St. Louis; Johnstown, Pa., San Francisco and South Ohio river; group four, with a rate of 35c., Eastern Los Angeles and Kansas City; group five, with a rate of 30c., includes Birmingham and the South. Prices and terms of payment and basing point provisions are similar to those included in the steel code as originally submitted but somewhat changed before it was signed by the President.

Can Industry Code Asks 40-hr. Week

WASHINGTON, Aug. 29.—The code of fair competition filed with the National Recovery Administration by the can manufacturing industry making metal containers provides for two wage districts, northern and southern, with a minimum hourly labor wage rate of 30c. in the North and 27½c. in the South. The maximum work week is set at 40-hr. in both districts during normal season demand, with the provision that the period may be increased by seasonal demands. Provision is made for adjustment of contracts made prior to June 16, 1933, the effective date of the Recovery Act, in order to cover increased costs arising from operation of the code. Also, if fulfillment of orders is delayed as the result of operation of the code, appropriate time is to be allowed for the completion of orders or contracts. Administration of the code is to be under the direction of a board of governors of 12 members. Each member of the code operating more than 25 factories will appoint three members, while each member of the code operating four or more but not more than 25 factories, will appoint one member. The remaining members of the board will be elected by members of the code operating less than four factories.

Organization Matters Occupy Steel Industry in First Meeting Under Code

NEW YORK, Aug. 29.—Routine organization matters occupied the attention of the first meeting of the board of directors of the American Iron and Steel Institute, held here today. Sitting with the board were the following representatives of the Administration, who will also attend future meetings: Kenneth M. Simpson, deputy administrator; Dr. Alexander Sachs, economist of NRA, and Donald Richberg, general counsel of the Recovery Administration.

A general administrative committee was appointed, headed by W. A. Irvin, president, United States Steel Corpn. His committee is to have charge of all matters which come up in the interims between meetings of the board. Commercial matters will be handled by a committee headed by S. E. Hackett, vice-president, Jones & Laughlin Steel Corpn. A committee on labor, of which Frank Purnell, president of Youngstown Sheet & Tube Co., is chairman, will have charge of labor relations other than hours and wages, which will be delegated to a statistical committee, headed by W. J. Filbert, vice-chairman, United States Steel Corpn.

Tabulation of prices, which are still being received from producing companies, will require some days to complete. In the meantime, prices published in THE IRON AGE of this week may be considered representative.

Age of Alloys Depicted by Mural

PROGRESS in industry and transportation brought about through the use of alloy steels and other alloys is strikingly depicted by a large carved glass mural at the Union Carbide & Carbon Corpn.'s exhibit at the Century of Progress Exposition. This pictorial representation of the Age of Alloys is engraved in special plate glass and colored; measuring 55 ft. in length, it is said to be the largest mural of its kind ever made.

In addition to this showing of advancement brought about through the use of lighter, stronger metal alloys, the corporation's exhibit includes several actual applications of alloy steels and other alloys. The corporation also cooperated in the construction of the Basic Science exhibit, "The Story of the Electric Furnace," which demonstrates the contribution of the arc, resistance and induction type furnaces to modern scientific progress.

Boiler Code Hearing Set for Aug. 31

WASHINGTON, Aug. 29.—Hearing on the code of fair competition of the boiler manufacturing industry has been set for Aug. 31 at the New Willard Hotel before Deputy Administrator Malcolm Muir.

Steel Founders' Code Hearing Sept. 7

HEARING on the code of fair competition filed with the National Recovery Administration by the Steel Founders' Society of America will be held Thursday, Sept. 7, in the Senate office building. Deputy Administrator King will preside.

Details of the code have been previously published in THE IRON AGE.

The code fixes 40 hours maximum work week and a minimum wage ranging from 25c. an hr. in the El Paso district to 40c. an hr. in the Colorado, Northern Ohio, Chicago, Detroit and Pittsburgh-Wheeling districts.

Navy Asks Bids For 6000 Tons Plate

THE Navy Department will open bids on Sept. 12 for approximately 6,000 tons of steel plates for ten destroyers to be built at navy yards. Two each will be constructed at Boston, Philadelphia, Norfolk, Puget Sound and Mare Island.

Code Prepared for Superior Ore

A CODE for the Lake Superior iron ore industry was prepared at a meeting of the Lake Superior Iron Ore Association and of representatives of the U. S. Steel Corpn., held in Cleveland, Aug. 25. This was attended by representatives of ownership of over 90 per cent of the ore in the Lake Superior district. Copies of the proposed code have been mailed to the ore producing companies for their approval. When thus formally adopted the code will be sent to the NRA in Washington. The proposed code deals mainly with working hours and wages of men employed in the ore mines.

New Prices on Rejected Sheets and Seconds

NEW sheet price lists contain important provisions relating to prices on seconds and rejected sheets. When primes are not included in an order, cold-rolled seconds are to be priced the same as hot-rolled pickled and hot-rolled annealed. Pickled primes and pickled rejected sheets are to be sold at the hot-rolled and hot-rolled annealed prime price for the same gages.

Employment in the United States increased in July for the fourth consecutive month, according to the Alexander Hamilton Institute. The institute states that from June to July, 477,000 persons obtained work as compared with 807,000 from May to June. Since the depression's low in March, an increase of 2,382,000 has occurred.

First Prices Filed Under Steel Code Cover Remainder of Quarter Only

Pig Iron Is Advanced 50c to $1 a Ton—Few Changes in Steel Prices —Differentials Over Pittsburgh Reduced at Chicago

BOTH steel releases and mill operations have undergone a further decline and there is nothing to suggest an early change in trend outside of a contra-seasonal upturn in automobile production. Steel ingot output has given fresh ground in most important producing centers and the national average has receded to 47 per cent of capacity from 50 per cent a week ago.

Part of the decline in production is attributable to prior purchases for stocking purposes, prompted by the upward trend of prices; much of it has been due to uncertainties growing out of nation-wide readjustment to the NRA program. But for the time being, steel producers are themselves so engrossed in making adjustments required by codification that the course of demand and output is commanding comparatively little attention.

THE filing of prices under the steel code has overshadowed other considerations in the past week. With Tuesday the deadline, there was a final rush of price schedules, with some producers waiting until the final day of grace before mailing their quotations. While it will take several days for the American Iron and Steel Institute to tabulate the prices filed, information at hand indicates that there have been relatively few changes in steel prices, although there have been rather widespread advances in pig iron.

The new quotations are limited to deliveries during the remainder of the third quarter. Fourth quarter prices cannot be filed before Sept. 1, since the code stipulates that shipments cannot be made beyond four months after the closing of a contract. Some producers intend to reaffirm their initial code prices for the final quarter, but others prefer not to commit themselves until they have more definite information on the effect of codification on their costs. Final agreement on a coal code, which now seems to be imminent, will aid materially in the clarification of costs, provided that there is no recurrence of labor disturbances.

ADVANCES in pig iron prices range from 50c. to $1 a ton. Base prices on foundry iron are now identical at $17.50, furnace, at Chicago, Detroit, Cleveland, Erie, Youngstown, Buffalo, Hamilton, Ohio, and in eastern Pennsylvania. The equalization of prices will have the effect of localizing business by eliminating much of the inter-territorial competition which has been a most unsettling market influence in the past. Southern prices have been increased from $13 to $13.50, Birmingham. On the Eastern seaboard, importers of pig iron are reported to be observing the code prices announced by domestic furnaces. Silvery prices have been advanced $1 a ton. THE IRON AGE composite price for pig iron has risen from $15.94 to $16.71 a gross ton. The depression low of $13.56 prevailed from November, 1932, to April of the current year.

VIRTUALLY the only changes in steel prices that have thus far come to light have occurred in cold-rolled sheets, fender stock, and plates, shapes and bars. Cold-rolled sheets have been advanced $3 a ton—No. 20 gage to 2.75c., Pittsburgh, and 2.85c., Chicago, and No. 10 gage to 2.30c., Pittsburgh, and 2.40c., Chicago. The separate automobile body and furniture sheet classification has been abandoned. Cold-rolled fender stock, No. 20 gage, has been raised $2 a ton to 2.95c., Pittsburgh or Cleveland.

The Pittsburgh base prices on plates, shapes and bars are unchanged, but the base quotations at Chicago have been reduced. Chicago prices on all of these products are now only $1 higher than at Pittsburgh instead of $2 higher, as formerly.

New extras on semi-finished steel are among the changes that are being introduced under the code. In fact, all extras will be made uniform and strict adherence will be enforced, since waiving of extras has been one of the most insidious and costly forms of "under cover" competition. Competition, under the code, is by no means eliminated, but it must be in the open. An "open price" policy has replaced the secret practices which, because of their secrecy, frequently magnified market weakness and invited competitive reprisals.

THE automobile and canning industries continue to be the chief reliance of the iron and steel industry. Motor car output has been gaining since the middle of August. The combined assemblies of General Motors, Ford and Chrysler for the month will total fully 190,000 units and the industry as a whole will go far beyond the 200,000 mark. Ford's September production is expected to exceed that of August, which is estimated at 57,000 cars. Automobile companies covered rather heavily in full-finished sheets in anticipation of the price advances just announced.

Foundry coke prices have been advanced 50c. a ton by Chicago, Toledo, Painesville, Ohio, and Ashland, Ky., producers. Gravel fluorspar has gone up $1 a ton to $15, mines.

THE IRON AGE composite prices for finished steel and scrap are unchanged at 1.979c. a lb. and $12 a gross ton.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Aug. 29, 1933	Aug. 22, 1933	Aug. 1, 1933	Aug. 30, 1932
Per Gross Ton:				
No. 2 fdy., Philadelphia	**$18.34**	$17.34	$17.34	$13.84
No. 2, Valley furnace	**17.50**	16.50	16.50	14.50
No. 2 Southern, Cin'ti	**18.23**	17.73	17.73	13.82
No. 2, Birmingham	**13.50**	13.00	13.00	11.00
No. 2 foundry, Chicago*	**17.50**	17.00	17.00	15.50
Basic, del'd eastern Pa	**17.84**	17.09	17.09	14.00
Basic, Valley furnace	**17.00**	16.00	16.00	13.50
Valley Bessemer, del'd P'gh	**19.89**	18.89	18.89	16.89
Malleable, Chicago*	**17.50**	17.00	17.00	15.50
Malleable, Valley	**17.50**	16.50	16.50	14.50
L. S. charcoal, Chicago	23.17	23.17	23.17	23.17
Ferromanganese, seab'd carlots	82.00	82.00	82.00	68.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$40.00	$40.00	$40.00	$43.00
Light rails at mill	30.00	30.00	30.00	32.00
Rerolling billets, Pittsburgh	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	26.00
Slabs, Pittsburgh	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh	31.00	31.00	31.00	33.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Sents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.60

Finished Steel

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.60
Bars, Chicago	*1.65*	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.95	1.95	1.95	1.95
Tank plates, Pittsburgh	1.60	1.60	1.60	1.60
Tank plates, Chicago	*1.65*	1.70	1.70	1.70
Tank plates, New York	1.898	1.898	1.898	1.898
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago	*1.65*	1.70	1.70	1.70
Structural shapes, New York	1.86775	1.86775	1.86775	1.86775
Cold-finished bars, Pittsburgh	1.70	1.70	1.70	1.70
Hot-rolled strips, Pittsburgh	1.65	1.65	1.60	1.45
Cold-rolled strips, Pittsburgh	2.25	2.25	2.25	2.00

Finished Steel

Per Lb. to Large Buyers:	Aug. 29, 1933 Cents	Aug. 22, 1933 Cents	Aug. 1, 1933 Cents	Aug. 30, 1932 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.25	2.25	2.25	2.10
Hot-rolled annealed sheets, No. 24, Gary	2.35	2.35	2.35	2.20
Sheets, galv., No. 24, P'gh	2.85	2.85	2.85	2.75
Sheets, galv., No. 24, Gary	2.95	2.95	2.95	2.85
Hot-rolled sheets, No. 10, P'gh	1.65	1.65	1.65	1.55
Hot-rolled sheets, No. 10, Gary	1.75	1.75	1.75	1.65
Wire nails, Pittsburgh	2.10	2.10	2.10	1.95
Wire nails, Chicago dist. mill	2.15	2.15	2.15	2.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill	2.15	2.15	2.15	2.25
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh	$4.25	$4.25	$4.25	$4.75

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$13.75	$13.75	$13.75	$9.25
Heavy melting steel, Phila	12.00	12.00	11.75	6.75
Heavy melting steel, Ch'go	10.25	10.25	10.75	6.25
Carwheels, Chicago	10.50	10.50	10.50	7.00
Carwheels, Philadelphia	12.75	12.75	12.75	8.50
No. 1 cast, Pittsburgh	11.75	11.75	11.75	9.50
No. 1 cast, Philadelphia	12.50	12.50	12.50	8.50
No. 1 cast, Ch'go (net ton)	10.50	10.50	10.50	6.25
No. 1 RR. wrot., Phila	12.00	12.00	12.00	8.50
No. 1 RR. wrot., Ch'go (net)	9.00	9.00	9.00	3.75

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$2.50	$2.50	$2.50	$2.00
Foundry coke, prompt	3.25	3.25	3.00	2.75

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery	8.75	8.75	8.75	5.37½
Lake copper, New York	9.00	9.00	9.00	5.75
Tin (Straits), New York	**46.12½**	44.12½	44.25	24.37½
Zinc, East St. Louis	*4.75*	4.85	5.00	2.85
Zinc, New York	*5.12*	5.22	5.37	3.22
Lead, St. Louis	4.35	4.35	4.35	3.45
Lead, New York	4.50	4.50	4.50	3.60
Antimony (Asiatic), N. Y.	6.87½	6.87½	7.25	5.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

▲ ▲ ▲

▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
Aug. 29, 1933	1.979c. a Lb.	$16.71 a Gross Ton	$12.00 a Gross Ton
One week ago	1.979c.	15.94	12.00
One month ago	1.973c.	15.94	12.08
One year ago	1.964c.	13.64	7.42
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1933	1.979c., Aug. 8	1.867c., Apr. 18	$16.71, Aug. 29	$13.56; Jan. 3	$12.25, Aug. 8	**$6.75**, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.037c., Jan. 14	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25; Jan. 11	13.08, Nov. 22

Buying Light at Pittsburgh as Code Prices Are Established

Steel Ingot Production Drops to 38 Per Cent and to 50 Per Cent in Valleys—Pig Iron Prices Advanced $1 a Ton

PITTSBURGH, Aug. 29.—On the eve of announcement of new code prices, the local steel market is virtually marking time. New orders for most finished steel products have declined further, and specifications against old low-priced contracts are practically cleaned up. Sellers are thus facing the new price era with a fairly clean slate, and, if the expected fall revival in demand materializes, immediate realization of the new prices may be expected. Considerable potential steel buying that has been held up by uncertainties surrounding the code is expected to be released after the turn of the month.

News of virtual agreement in the codification of the coal industry has removed another depressing factor that has beset the steel industry in the past month. As soon as the major industries are codified, further impetus to general business is expected to come from a speeding up of releases of important Government construction projects. Pittsburgh steel makers, however, are inclined to doubt whether preliminary negotiations for this work will be dispatched quickly enough to benefit rolling schedules before the middle of winter. Steel demand for road construction programs will probably not be important until next spring. Private projects still are handicapped by lack of capital, although some hope for steel from that source is prompted by prospective Federal pressure to ease credit.

Current demand for heavy hot-rolled products is negligible. Structural inquiries and awards involve only minor lots. Fresh interest in bars is extremely light, while calls for plates are limited to small tank projects and brewery work. With the exception of a lively demand last week for extra wide auto body sheets, sheet demand has dwindled. Tin plate continues to resist the trend in other products. Demand from the canners for deliveries in the past week was the heaviest this year. Tin plate operations are consequently sustained at about 95 per cent of capacity.

Steel ingot output in the Pittsburgh district continues to decline, with this week's schedules averaging about 38 per cent of capacity. Production in the Valleys and nearby northern Ohio mills is also off to 50 per cent. Operations in the Wheeling district are sustained at 80 per cent.

Pig iron prices in the Pittsburgh district and in the Valleys have been advanced $1 a ton, in line with new quotations filed under the iron and steel code. Scrap and fuel markets continue to be dull.

Pig Iron

Prices have been advanced $1 a ton, to take effect immediately and continue through September. Basic iron is now posted at $17, Valley furnace, foundry and malleable at $17.50, and Bessemer at $18. Prices are 50c. a ton higher f.o.b. Pittsburgh district furnace. The advanced quotations are those filled under the iron and steel code, and, while applicable to shipments through the remainder of third quarter, will probably be reaffirmed for fourth quarter. The upward readjustment is held to cover increased fuel and labor costs. Although the advance was not unexpected, bookings failed to expand in anticipation of the increase. Non-integrated makers are generally covered through third quarter and are not likely to enter the market until near the close of the period. Foundries are likewise covered. Movement of pig iron to makers of ingot molds and iron and steel rolls has fallen off perceptibly. Aggregate shipments during August are expected to fall somewhat short of July deliveries.

Semi-Finished Steel

With the exception of a sustained demand for sheet bars from tin plate mills, semi-finished steel is moving at a somewhat slower pace. The recent decline in operations at some non-integrated mills has resulted in further accumulation of inventories, and current requirements of billets, slabs and sheet bars are generally small. Demand for wire rods is holding up fairly well. Prices are very firm. Billets, slabs and sheet bars are held at $26, Pittsburgh or Youngstown, forging billets at $31, Pittsburgh, and wire rods at $35, Pittsburgh or Cleveland.

Bars, Plates and Shapes

Movement of heavy hot-rolled products continues to decline. Although the Federal rehabilitation program is expected to gain momentum soon after the iron and steel code becomes operative, the slowness that has characterized recent releases has engendered considerable doubt that launching of important projects will be timely enough to bring much tonnage to local mills before the late winter months. Fresh structural projects are few and involve only small tonnages. Recent awards have likewise been unimportant from a tonnage standpoint. Although Federal appropriations have been granted to a number of States for road construction, a large part of this work will have to be deferred until early spring. Reinforcing bars are consequently facing a rather obscure outlook for some months to come. Plates are still depressed by the absence of new barge business. A few tank projects have appeared, but tonnage requirements are small. Railroad repair work is not providing much tonnage, although calls from the brewing industry are well sustained. Forging bars are quiet.

Although no change under the steel code is expected in the 1.60c. base price, Pittsburgh, on bars, plates and shapes, uniform adherence to that price following announcement of code prices will in some cases represent an advance in view of the fact that concessions are outlawed by the code.

Rails and Track Accessories

Miscellaneous specifications for track supplies continue to be meager. Significant interest in rails is still absent, although some buying is in prospect this fall. Shopping of cars for rehabilitation for winter service has not yet stimulated much demand for steel parts.

Wire Products

Specifications from the automotive industry continue to contract, although miscellaneous demand is holding up fairly well. August bookings, however, have not matched those for July. Wire mills have practically fulfilled old commitments, but are maintaining operations at around 60 to 65 per cent of capacity.

Bolts, Nuts and Rivets

Total orders for August are slightly below July bookings. Current demand is negligible. Prices, however, are steady. Bolts and nuts are quotable at 73 per cent off list, and large rivets at $2.50, base per 100 lb., Pittsburgh or Cleveland, for shipment through third quarter.

Sheets

Although demand from motor car makers has been surprisingly brisk in the past week, general calls for sheets have dwindled. The insistent demand for exceptionally wide auto body sheets in the past few months has brought a gradual improvement in rolling of these sizes at some mills, resulting in a smaller percentage of seconds. Sellers have thus been able to reduce size extras that have ruled

on unusually wide full-finished grades. Announcement of sheet prices filed under the code is expected to reveal higher levels on some finishes. Although resistance to increased quotations will likely develop in the automotive industry, sellers expect to adhere strictly to full schedules following establishment of new prices. With backlog orders practically completed, sheet production has declined to approximately 50 per cent of capacity.

Tubular Goods

Demand for all classes of tubular products is apathetic. Mechanical tubing is affected by reduced specifications from the automotive industry. No new line pipe projects have appeared, although some new extensions in the Conroe and East Texas oil fields are in prospect within the next 60 to 90 days. Oil country goods continue quiet. Size and quantity extras, which have been filed under the code, will be strictly adhered to following announcement of new cards this week.

Cold-Finished Steel Bars

Specifications and orders in the past week were the lightest in many weeks. Demand from the automotive industry was particularly light. The current price of 1.95c., Pittsburgh, is expected to be reaffirmed upon announcement of code quotations.

Tin Plate

Mills are still engaged at about 95 per cent of capacity. Calls for deliveries last week were the heaviest experienced this year. In the face of spotty crop reports, the present character of demand is considered extraordinary. The recent storm along the Eastern Seaboard is reported to have damaged crops considerably, and, while reflection of the damage in tin plate demand cannot yet be measured, it will undoubtedly have a definite effect on specifications next month.

Strip Steel

Demand continues to contract, and mills have been able to work off backlogs. Operations are scheduled at slightly less than 50 per cent of capacity. Fill-in orders have been booked at the current price of 2.25c., Pittsburgh, for cold-rolled, and 1.65c. for hot-rolled. These prices are expected to be reaffirmed under the code for delivery through third quarter.

Coke and Coal

This market continues to be very quiet. Current movement is restricted to acceptances against contracts, and fresh buying is negligible. Furnace coke is quotably unchanged at $2.50 to $2.75, Connellsville, and standard brands of foundry coke are still available at $3.25, Connellsville. The asking price for premium brands of foundry coke remains at $4.50. Bituminous coal quotations are virtually nominal in the absence of transactions. Large users are still taking shipments against orders placed during the strike, and further major tonnage covering is not looked for in the immediate future.

Scrap

In the absence of sales during the past week, No. 1 heavy melting steel remains unchanged at $13.50 to $14. The market on that grade is stalemated by the reluctance of consumers and dealers to enter commitments. Other grades are moving very slowly. No. 2 steel, though unchanged, is easier as a result of heavy rejections. A recent sale of blast furnace scrap has established short mixed borings and turnings and cast iron borings 25c. a ton lower at $9.75 to $10.25. Heavy breakable cast, compressed sheets and hand bundled sheets are slightly higher. Specialties are inactive.

Pig Iron Advance Drives in Orders at Cincinnati

CINCINNATI, Aug. 29.—Pig iron demand has been stimulated by advance announcement of price increases on Northern iron for September delivery, and reports of an early rise in Southern quotations, which were confirmed today. The new quotations on Southern iron are $18.23, delivered Cincinnati, an increase of 50c. a ton. Bookings totaled about 1300 tons, of which approximately 300 tons was Southern iron. The new schedules on Northern iron establish a universal base rate of $17.50, Hamilton furnace, for delivery anywhere, with the established differentials of 25c. for each 25 points of silicon. The delivered price in Cincinnati for the base grade is now $18.63, and books are open for September deliveries. An Ohio consumer bought 500 tons of Northern foundry iron and an Indiana melter took 300 tons. Orders for 100 tons of Southern iron each were placed by a southern Ohio melter and a Kentucky user.

Coke

By-product foundry coke prices will advance, Sept. 1, 50c. a ton, the new quotation being $9.09, delivered in Cincinnati. Domestic grades are also up 25c. to $5.31, wholesale, delivered in Cincinnati, after the first of the month.

Steel

Continued heavy ordering of automobile manufacturers and slight improvement in miscellaneous demand have brought mill bookings back to near 70 per cent of capacity.

Scrap

Embargoes in the Valley district have stopped the upward trend of dealers' bids on scrap here and contributed an uncertain undertone to the market. Dealers are reluctant to make commitments, although the trade feels that the halt in price advances is only temporary and that further increases are inevitable.

Pig Iron Shipments Heavy at St. Louis

ST. LOUIS, Aug. 29.—Shipments of pig iron against contracts continue at a heavy rate. While there may be a few instances of lagging deliveries, they are offset by those who have been anticipating specifications. There has been virtually no new buying, and none is expected until after fourth-quarter books are open. The melt of foundry iron is increasing, especially in the Belleville stove district, whose 12 foundries are working to about 70 per cent of capacity. One East St. Louis foundry catering to the stove trade is working a double shift. Malleable foundries in the territory supplying parts to the automobile trade are busy.

The trade in finished steel continues slow, as has been the case since Aug. 1, when a policy of waiting for the adoption of the steel code began.

The scrap market is comparatively quiet. Mills are showing a certain amount of hesitancy. Dealers find that it is hard to buy material. Borings and turnings showed a little activity during the week. Railroad lists: Mobile & Ohio, 22 carloads; Chicago, Milwaukee, St. Paul & Pacific, 133 carloads of miscellaneous scrap and 2000 tons of rerolling rails; Chicago, Burlington & Quincy, 3000 to 4000 tons.

Cast Iron Pipe

Fond du Lac, Wis., has placed 10,680 lineal ft. of 6 to 12-in. class 250 with Central Foundry Co., New York, at low bid of $10,576.86.

Milwaukee Board of Park Commissioners, Milwaukee, closes bids Sept. 5 for 9270 lin. ft. of 16-in. class B water pipe for Kinnickinnic River flushing main.

Winchester, Ohio, plans pipe line for water system, including new pumping station. Cost about $35,000. Heer Engineering Co., Terre Haute, Ind., is engineer.

Coopersville, Mich., plans pipe lines for water system.

Lynchburg Foundry Co., Lynchburg, Va., tendered low bid to Washington, for about 100 tons pipe and specials at $63.50 per ton.

Miami, Fla., plans extensions in pipe lines from city to Hialeah for water supply. Cost about $560,000. Financing is being arranged.

San Clemente, Cal., plans installation of 46,750 ft. of 4-in. for new water system. Fund of $40,000 is being arranged. W. A. Ayer is city engineer.

McNeil Island, Wash., has awarded 238 tons of 6 to 18-in. to American Cast Iron Pipe Co.

Victorville, Cal., has completed plans for 350 tons of 4 and 6-in.

Moderate Improvement in Steel Bookings at Chicago

But Output Falls Another Point to 46 Per Cent of Capacity—Pig Iron Up 50c. a Ton, Steel Prices Undergo Few Changes

CHICAGO, Aug. 29.—Price filing under the new code has the center of the stage in the local iron and steel market. For the most part changes are not radical beyond the stipulations as to basing points and the fact that mills must quote consumers on a delivered basis by adding switching and freight charges to base prices. Sellers are limiting new quotations to the period extending to the end of September. However, some producers openly state that they will extend their new prices through the fourth quarter, books opening for that period on Sept. 1, as provided in the code.

Both specifications and new sales of finished steel are moderately improved, but the gains still leave totals well below the peaks established earlier in the summer.

Ingot output has dropped one point to 46 per cent of capacity and two steel mill blast furnaces remain banked. Rail programs are being formulated, it is said, though actual inquiries are lacking. If reports are correct, purchases of railroad equipment are a step nearer.

Pig Iron

Northern producers have advanced prices 50c. a ton for September delivery. No. 2 iron is now being quoted at $17.50 a ton, local furnaces. Producers have not yet announced quotations for fourth quarter. August shipments are on a par with those of July. One merchant stack is in blast in this district.

Coke

Prices for by-product foundry coke for September delivery will be $8, local ovens, an advance of 50c. a ton. Prices for delivery in the Chicago switching district are $8.75. August shipments show a marked improvement over the total for July.

Wire Products

Bookings of new tonnage are light, which is a condition generally prevailing at this time of year. Specifications, though lower than a week ago, are still ample to support output at 50 to 55 per cent of capacity. Sellers view the present situation with satisfaction and are hopeful that September will witness a revival of buying. Jobbers remain comparatively inactive as they await the passing of summer. Wire producers are experiencing some difficulty in classifying and defining the jobbing trade in accordance with the stipulations of the code. Utilities are buying only such copper wire as is needed for maintenance work and radio manufacturers are evidently digesting some of their stock on hand. The Government is taking preliminary figures on copper wire needs for Boulder Dam.

Sheets

Hot mills in this area are running close to capacity and in some gages books are full until the end of October, on which basis deliveries range from seven to eight weeks. New price schedules are now being filed under the terms of the code.

Reinforcing Bars

G. R. Fehr, Inc., has placed 3200 tons of reinforcing bars for a sewage treating plant at Milwaukee. Concrete Steel Co. and Truscon Steel Co. share equally in the business. Mills report a heavier movement of deformed bars into road and bridge work in the Central West. Some new tonnage is in sight for brewery and distillery work.

Rails and Track Supplies

A Western railroad has released 1000 tons of rails against an old order. This tonnage, with several smaller releases, serves to keep local mills running on light schedules. It is reported that most railroads are now figuring on rail purchases but no definite inquiries are yet before the trade. Track accessory releases remain in fair volume.

Bars

Most Chicago sellers are filing prices for soft steel bars at 1.65c. a lb., thereby reducing the differential between Chicago and Pittsburgh to $1 a ton. Demand is somewhat erratic. New buying continues to drop away slowly but specifications are brisk, affording one unit an output of 80 per cent of capacity. The relative activity in specifying is due not so much to actual consumption as the desire of consumers to take out all commitments made at prices named before the filing of new quotations under the code. Demand from builders of automobiles is on the whole lighter, though here and there a plant is producing above its previous high level. Farm implement manufacturers are taking more steel and foresee still higher production in September and throughout the fall months.

Plates

Brewery work is again a feature of the plate market, and bids are being taken on a distillery to be built at Peoria, Ill. The Heil Co., Milwaukee, is taking bids on plates for tanks and heads for a brewery at Fort Wayne, Ind. A number of independent oil producers contemplate constructing a joint oil line extending from the Mid-Continent fields to Chicago. Producers of plates are filing prices of 1.65c. a lb., Chicago, effective at once. This is a flat price, all preferentials to consumers being dropped.

Structural Material

Fabricating awards, at 2700 tons, represent an improvement and fresh inquiries call for about 9000 tons. The Morris, Ill., bridge is being temporarily held back because of a dispute as to a right-of-way. Included in new inquiries is 2500 tons for a distillery at Peoria, Ill. Several new breweries also are being contemplated, and a bridge program in Missouri calls for 1200 tons of steel. New prices for plain material are being filed at 1.65c. a lb., Chicago, thereby establishing a differential of $1 between Chicago and Pittsburgh.

Cast Iron Pipe

This market remains quiet pending the time when Government loans will bring tonnages out for figures. The contractor for the Milwaukee sewage treating plant is letting some contracts on a provisional basis. So far the pipe has not been placed. The Milwaukee Park Commissioners will buy 9200 ft. of 16-in. pipe. Fond du Lac, Wis., has awarded about 11,000 ft. of 6 to 12-in. pipe to the Central Foundry Co.

Scrap

This market shows some unsettlement, but the trend is not yet sufficiently clear to indicate the actual course of prices. The last price paid by a mill for heavy melting steel was $10 a ton, but the scrap involved had the earmarks of distress tonnage. The Illinois Central has recently sold heavy melting steel for about the equivalent of $10.50 a ton, delivered, and dealers are quite ready to pay $10 to cover old commitments. Mill buying is very slack, ingot output having receded to lower levels with the passing of each week. One more boat load of heavy melting steel is scheduled to leave Chicago in the near future for Lake Erie. It is thought by some that this cargo will end the water movement for the current season.

Pig Iron Prices Advanced in Eastern Pennsylvania

Increases of $1 a Ton on Foundry, Malleable and Bessemer and 75c. on Basic — Steel Output Off

PHILADELPHIA, Aug. 29.—With new prices under the steel code becoming effective today, the trade is anxiously awaiting the effect of this completely new system of operating the iron and steel industry. Although there is inevitably set up a much tighter Government control of the business than has ever hitherto prevailed in peace time, the innovation is being accepted in entirely good faith with the hope that it will give stability to the market and eliminate practices that long have been a source of trouble. Barring labor disturbances, a factor that is being watched with some concern, it is believed that the code system can be made to operate constructively.

Such a sweeping change from the old established system of individual initiative naturally has created a great deal of confusion pending the period of adjustment to the new Government-business partnership. Especially true as to the new price system, the trade is anxious to learn details of quotations filed today or previously with the American Iron and Steel Institute. The expectation and hope here is that prices will be adjusted to a uniform basis, though it is realized this may not be evident from the outset by reason of the great volume of quotations submitted.

The first announcement received here concerned a reported reduction of $1 a ton in structural shapes at Eastern mills (Bethlehem, Pa.). This has not been confirmed, however. Pig iron prices, on the other hand, have been advanced by Eastern furnaces, foundry, malleable and Bessemer being moved up $1 per ton, while basic was increased 75c. Low phosphorus, quoted on the new furnace bases, has been established at $22. These prices also are to remain in effect until Sept. 30.

Demand for both pig iron and finished steel has fallen off and operations on backlogs have become more general. Open-hearth output has dropped four points to 40 per cent of capacity.

The high water of last week flooded several mills in this district and closed a number of units temporarily. Repairs have been made and operations resumed.

Pig Iron

Foundry, malleable and Bessemer grades have been advanced $1 per ton and basic 75c. per ton under the iron and steel code. The price of low phosphorus iron has been fixed at $22 at the new basing points, Steelton and Birdsboro, Pa., Standish, N. Y., and Johnson City, Tenn. The increases became effective Aug. 25 and are to cover shipments up to Sept. 30. Importers have volunteered to adopt the prices of domestic iron. No fourth quarter quotations on sales are to be made until after Aug. 31. Consumers appear to have ample supplies on hand for the present melt, which has decreased with the result that inquiries and sales are chiefly confined to carlots.

Plates, Shapes and Bars

Demand is light. The uncertainty pending the adoption of prices under the code is held partially responsible for hesitancy of buyers to come into the market. The let-down also is due to the heavy buying movement prior to price advances. The only announcement here today as to new prices under the steel code is a reported quotation of 1.65c., Bethlehem, Pa., on shapes to continue in effect until Sept. 30. This would reflect a reduction of $1 a ton, reducing the differential over the Pittsburgh base price from $2 to $1.

Sheets

Specifications in August fell 30 per cent or more below those of July. While there still is fair business in full-finished material, it has slackened in recent weeks and mills are operating on backlog tonnage. Stability of prices is looked for under the steel code, and it is reported that the practice of quoting on mill run sheets will be stopped. Complaints have been made that the practice lent itself to the sale of inspected material at mill run prices.

Warehouse Business

Jobbers report that August requirements were somewhat less than those of July. Prices remain unchanged.

Scrap

The market remains dull and while its tone is somewhat easier prices are unchanged. Except for occasional transactions, mills continue to withhold purchases. Fair-sized lots of heavy breakable cast have been taken by nearby mills the past week at the regular market quotation of $11.

Southern Pig Iron Prices Advance 50c. a Ton

BIRMINGHAM, Aug. 29.—The moderate decline in pig iron requirements still persists, with no indication as to when a turn for the better may be expected. August shipments were slightly behind those of July. New business in August was of comparatively small size because of earlier forward buying, and the same condition will prevail in September prior to fourth quarter contracting. The furnaces have advanced prices 50c. a ton to $13.50 for September delivery only.

Woodward Iron Co. has blown out its No. 2 furnace and has blown in its No. 1 stack. The number of active furnaces in the district is unchanged at eight. Republic Steel Corpn. is planning to change one of its two operating furnaces from foundry to basic iron shortly. Republic is also placing its Spaulding ore mine in regular operation for the first time since 1920. Three years ago this mine was completely remodeled, but by the time it was completed the ore was not needed. Spaulding supplements the supply from Raimund, which is Republic's chief source of ore.

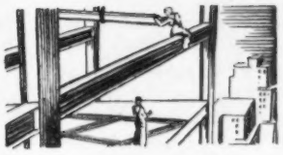
Cast iron pipe demand has been even more sluggish of late and August bookings of Birmingham plants have been running 25 to 40 per cent under those of July. Plant operations have also been on a more restricted basis.

Steel

Steel buying is largely of a routine character. This condition has prevailed since early in the month. The August bookings of the two producers in this district show a considerable decline from June and July. Present mill operations are sustained mostly by backlogs. Open-hearth production has remained unchanged at 13 units since Aug. 10.

Construction contracts awarded in the 37 eastern states from Aug. 1 through Aug. 15, totaled $56,243,600, according to F. W. Dodge Corpn. This figure is 30 per cent higher than the total for the first half of July but was about 12 per cent smaller than in the corresponding half of August, 1932.

New Buying Light in New York District—Iron Prices Higher



Finished Steel Specifications Fairly Well Maintained — Base Prices Not Expected to be Changed Under Code Filing

NEW YORK, Aug. 29.—Specifications for finished steel products have held up fairly well in this district in the last week, although new buying has been negligible. Steel producers have not been anxious to make commitments until new base prices with accompanying extras and differentials are clarified by filing with the American Iron and Steel Institute under the steel code. Consumers of steel are now fairly well stocked and pressure for shipments on their part has abated to some extent. In many cases manufacturing consumers have reduced their operating schedules because of lighter demand for their products but there is a general feeling that the current lull in general business activity may come to an end soon after Labor Day.

New steel prices to be filed today under the code are generally understood to be unchanged from recent maximum levels. An exception may occur in the case of light cold-rolled sheets, which are expected to be advanced to 2.75c., Pittsburgh. The quotations to be named are to apply only for the remainder of the third quarter and shipments against such business must be concluded by Sept. 30. Fourth quarter prices, which must be filed with the Institute by Sept. 20, will likely reflect certain upward adjustments and thus bring out anticipatory tonnage, as is generally the case in an advancing market. Of far more importance to the stabilization of prices in the industry is the complete standardization of all extras and differentials under the steel code. While nearly all such extras and differentials have been quoted in the past, differences have existed in the schedules of many companies, and the waiving of these additional charges has always been a favorite method of making price concessions. Further details will be available with the final release by the Institute of such figures.

Pig Iron

Having generally retired from the market, consumers are apathetic to the recent price advance. Eastern Pennsylvania brands have risen $1 a ton, and are currently quoted at $18.02 to $19.02 a ton, delivered to eastern New Jersey points. Shipments continue to go forward in satisfactory volume. Current sales are mostly scattered spot carloads, although some late September iron has been booked. A 1000-ton order brought the week's total sales to 2500 tons, as compared with 3000 tons last week and 5800 tons a fortnight ago. A 12,000-ton purchase of foundry iron was made in the New England district last week. but the identity of the buyer has not been disclosed. Low phosphorus producers have adopted silicon differentials and are currently quoting $22 a ton, furnace, for both standard and copper-bearing iron up to 2 per cent silicon content. For each additional 25 points of silicon 25c. will be added to base quotations. Producers may soon announce fourth quarter prices.

Reinforcing Steel

Awards are limited to scattered lots of New York and New Jersey road mesh. Lettings of reinforcing bars are negligible. The American Steel & Wire Co. was awarded 1690 tons, and Kalman Steel Corpn. 575 tons of mesh for New York highway construction. Pending business in highway mesh totals over 2000 tons. In addition, an award of 350 tons for a Buffalo hospital addition will shortly be announced, and over 100 tons of bars will be necessary for additional work at Jones Beach, Long Island, N. Y.

Scrap

With mills and foundries withholding releases, brokers and yardmen have deserted the current market. Considerable price weakness has developed and the general market tone is decidedly soft. On the strength of scattered movements, No. 1 heavy melting steel dropped to $8 a ton, barge. No. 1 heavy breakable cast and steelworks stove plate likewise eased off, and are now quoted 50c. lower at $6.25 and $5.50 a ton, respectively. Export scrap continues to leave Southern ports for Italian melters. Local brokers, however, are unwilling to make additional export commitments in view of the present unstable price structure.

Further Drop in Steel Output at Buffalo

BUFFALO, Aug. 29.—Steel production in this area has dropped to 41 per cent of capacity, with the equivalent of 15 open-hearths in operation. No explanation for the reduction, which compares with an early summer high of 63 per cent of capacity, is given, other than to say demand has been curtailed and specifications are slowing up considerably prior to the holiday. A good autumn demand for structural shapes is already assured in this district. Bids on the Grand Island bridges are due about Sept. 15, involving nearly 15,000 tons of structural steel and reinforcing bars. Much other public work is nearing the contracting stage and several good-sized jobs will be covered shortly by low bidders on other projects. Sheet demand has dropped to such a point that district operations are around 40 per cent. Wire demand is reported steady, but labor troubles are causing considerable concern in local plants.

Pig Iron

One local producer of pig iron has advanced prices 50c. a ton to $17.50, Buffalo, for No. 2 foundry and $18 for malleable. The new prices are effective immediately and will apply on all new business for delivery up to Oct. 1. On Sept. 1 orders will be taken at the same prices for fourth quarter. Demand for pig iron is limited to small lots. August shipments indicate a steady consumption of iron in Eastern territory and have reduced materially stocks of malleable and foundry iron here. One merchant furnace, one operated by a radiator subsidiary and four steel works stacks are in production in this district. Further units will not be added this quarter, and some of the steel works furnaces are on reduced blast due to smaller consumption of metal in their open-hearths. The movement of iron by the barge canal continues steady, and is running substantially in excess of the 1932 total.

Scrap

Scrap demand in the local district is rather slow. Purchases of material which is being shipped here by water are holding down local buying to a very large extent. Considerable activity is reported in borings and turnings at prices higher than were paid in the last tonnage purchases late in the second quarter. Incoming boat scrap is said to consist of old bundles from tidewater sources, and No. 2 heavy melting steel and turnings and borings from Great Lakes points. Dealers' lists on many materials are nominal because of the absence of tonnage purchases.

Automobile Code Seen as "Open Shop" Victory

DETROIT, Aug. 29 (By Telegram)—The automobile industry looks upon President Roosevelt's approval of its code giving it the right to "select, retain or advance employees on the basis of individual merit without regard to their membership or non-membership in any organization" as a distinct open shop victory. Aside from the steel industry the American Federation of Labor has recently intensified its efforts in the automobile industry more than in any other field and while admittedly it has been able to secure a certain group of adherents its progress is understood to have been far from satisfactory to its leaders.

The disinterested attitude on the part of the rank and file of automobile workers is attributed to the fact that, generally speaking, their wages are higher and their working conditions better than in most industries and the men have fewer real grievances. The beneficial effects of the code have already been realized to a considerable extent for almost all motor car companies in the last few months have shortened the work week thereby employing more men and have increased wages as much as 20 per cent. Since April 1, the industry has added 37,000 men, an increase of 40 per cent in the total number employed and in the last six weeks has taken on 4000 men to fill newly created jobs.

If the industry next year should make two and a half million cars which is regarded as a conservative gain over this year 81,000 more men will have to be employed under the code's provisions. All of these figures are based on the activities of members of the National Automobile Chamber of Commerce and do not include the Ford Motor Co. which does not belong to the chamber. The employment index of the Detroit Board of Commerce stood at 63.3 on Aug. 15 compared with 62.4 on July 15 and 32.9 on Aug. 15 of last year. As the industry is about to enter its slack season no further gain in employment is expected in the near future.

Although Henry Ford has not subscribed to the code it is the consensus of opinion in Detroit that he will fall in line. His wages for years have been above the minimum specified by the code and now that the threat of unionization has been removed, it is believed that he will not hesitate to subscribe. It is reasonable to assume that the other manufacturers in the industry would not have agreed to the code which increases their costs unless they were convinced that Mr. Ford would submit to similar regulation.

Pig Iron Prices Higher in New England

BOSTON, Aug. 29.—Prices for most brands of pig iron consumed in New England, including eastern Pennsylvania, Buffalo, Mystic and Indian, have been advanced $1 a ton, effective on shipments made prior to Oct. 1. Consumers claim Dutch iron has been offered them at base prices equivalent to those quoted on domestic brands, but that silicon differentials in some instances have been waived. The price advance has been partly offset for consumers at some seventy-odd New York, New Haven & Hartford Railroad points by reductions in freight rates, effective Aug. 30, averaging around 70c. a ton. Contrary to expectations, pig iron sales were fairly large the past week, running well up into four figures and including one 1000-ton lot, all for third-quarter delivery. There are no open inquiries of importance.

Business in scrap is practically at a standstill. Mills in the Pittsburgh and eastern Pennsylvania districts are still holding up shipments on contracts, and buying by New England consumers has dropped to a minimum. Prices are purely nominal, brokers refusing to quote under existing conditions. The General Electric Co., Lynn, Mass., closed bids Aug. 28 on 1800 tons of blast furnace scrap and smaller tonnages of bundled skeleton and punchings.

Warehouse prices on most forms of finished iron and steel have been advanced 15c. per 100 lb., and stove bolts are 70 per cent off the list, as against 70 and 10 per cent heretofore.

Increase in Structural Inquiry on Coast

SAN FRANCISCO, Aug. 28.—The extensive highway programs of the 11 Western States have been launched with the calling for bids for construction in 51 counties. Paving work will require 765 tons of reinforcing bars, while highway bridges will call for 1333 tons of structural steel and 525 tons of bars. Projects on which bids have been asked are chiefly in northern California and in the Pacific Northwest, but additional work is expected shortly in connection with the State programs, which call for an estimated expenditure during the fiscal year of over $170,000,000.

Although new inquiries reported during the week include no outstanding tonnages, their increased number has been encouraging and is taken by the trade as an indication of the activity that is expected to develop shortly. Work calling for 1953 tons of structural steel and 1694 tons of bars was added to the list of projects pending.

Structural steel awards reported during the week were limited to 508 tons, while reinforcing lettings totaled 3941 tons. The latter included 3800 tons for the Bureau of Reclamation, which was divided between the Pacific Coast Steel Corpn. and the Colorado Fuel & Iron Products Co.

Plate business is featured by the placing of 5080 tons for the Pine Canyon dam conduit with the Consolidated Steel Corpn.

Production of Basic Bessemer Rail Steel

The manufacture of basic Bessemer steel for rails in the Saar district was discussed by K. Eichel in *Stahl und Eisen*, May 18. A pig iron of 3.5 per cent carbon, not exceeding 0.5 per cent in silicon, of 1 to 1.2 per cent manganese, 1.8 per cent phosphorus and not over 0.07 per cent in sulphur, is preferred. Deoxidation of the charge is obtained by adding 78 per cent ferromanganese 7 to 8 min. before teeming, preferably in the liquid condition. At one steel works, a weighed quantity of the spiegeleisen is placed in the ladle before pouring; at another, liquid 10 per cent forrosilicon is used; at a third works, spiegeleisen is added during the pouring and then 88 lb. (40 kg.) of ground 45 per cent ferrosilicon and finally ½ lb. (200 g.) of aluminum per ton of steel are added before teeming into the mold; at still another plant, 2 kg. aluminum and 40 to 45 kg. of 90 per cent ferrosilicon are placed in the ladle before pouring.

The time of teeming 4-ton ingots ranges from 8 to 19 min., with an average of 10½ min. The average temperature of teeming is 1510 deg., with a range of 1430 to 1530 deg. A typical ingot mold is 90 in. high, 20 in. square at the top, 24 to 25 in. square at the bottom, inside, and the wall thickness is 4¼ in. at the top and 5 to 5½ in. at the bottom.

Surface defects are particularly noticeable in the case of rails of over 0.20 per cent silicon, but that fact is attributed to increased difficulties of oxidaton and killing rather than to the high silicon.

Business Light at Cleveland Pending Filing of Prices

Code Quotations Include Few Changes in Steel Prices—Pig Iron Advanced $1 a Ton—Steel Output Drops Sharply

CLEVELAND, Aug. 29.—Present steel prices will not be changed for September shipment with the exception of cold-rolled and auto body sheets, which have been advanced $3 a ton. At least these are the only price changes that have been announced in the price list filed by producers under the iron and steel code. Bars, plates and shapes remain at 1.60c., Pittsburgh, bars at 1.65c., Cleveland, hot-rolled strip at 1.65c., Pittsburgh, and cold-rolled strip at 2.25c., Cleveland or Pittsburgh. Semi-finished steel, rails and track equipment are unchanged. All announced prices are for September shipment, as fourth quarter prices cannot be filed until Sept. 1. Mill run cold-rolled sheets are eliminated in the new price lists, this grade being quoted only in inspected material.

Prices on foundry and malleable pig iron have been advanced $1 a ton in Cleveland and in the Valley district and 50c. in Detroit, Toledo and Erie. With 50c. advances in Chicago and Buffalo, prices are uniform at Lake ports except on malleable iron in Buffalo.

Foundry coke has been marked up 50c. a ton and gravel fluorspar $1 a ton.

With the uncertainties resulting from the filing of prices under the code, steel business was limited in volume during the week, although specifications held up fairly well. Some of the mills have deferred filing their prices with the Iron and Steel Institute until the deadline set for today, and several of the local sales offices have not yet been advised of their new prices.

Mill backlogs have been sharply reduced and in the absence of new tonnage steel plant operations in the Cleveland-Lorain territory were sharply reduced this week. Each producer curtailed operations. Six open-hearth furnaces were taken off, bringing ingot output down to 50 per cent of capacity, a reduction of 13 points from last week. August steel shipments have been well ahead of those in July with several leading producers, although new bookings have shown a consistent decline.

Pig Iron

Prices have been advanced $1 a ton to $17.50, Cleveland and Youngstown, for foundry and malleable iron for delivery until Oct. 1, and 50c. a ton to the same basis in Toledo and Detroit. The new prices have been filed under the iron and steel code. With a 50c. advance in Chicago and Buffalo, all Lake furnace prices have been equalized, the only exception being the usual 50c. differential on malleable iron in Buffalo. The code regulations will do much to eliminate competitive conditions that often have led to price shading by producers in order to sell iron at points having lower freight rates from other furnaces. There is little new business, but shipments this month will show a substantial increase over July. The Interlake Iron Co. has blown in its second stack at Toledo.

Sheets

An advance of $3 a ton has been made on light and heavy cold-rolled sheets and on auto body sheets in the new price schedules that have been filed under the code. The mill run classification of cold-rolled sheets has been eliminated. Other grades are unchanged. The new prices are for September shipment only. Heavy cold-rolled are quoted at 2.30c., Pittsburgh, light cold-rolled at 2.75c. and auto body at 2.30c. for No. 10 and 2.75c. for No. 20. Specifications held up fairly well the past week. While awaiting operations and naming of prices under the code, mills have taken little new business and only for prompt shipment. A Cleveland plant has started the manufacture of steel barrels for which it has placed a round tonnage of hot-rolled sheets.

Coke

By-product foundry coke has been advanced 50c. a ton by Toledo and Painesville, Ohio, Ashland, Ky., and Chicago producers, effective Sept. 1. The new price delivered Cleveland is $8.75. The market is not active.

Iron Ore

Water shipments of Lake Superior ore will be approximately 5,000,000 tons in August, a large gain over July. Three boats are reported to have been withdrawn from the ore trade during the week.

Bolts and Nuts

Orders have declined 20 to 25 per cent this month, as compared with July. The industry is operating at about 35 per cent of capacity. Present prices are expected to prevail through September.

Bars, Plates and Shapes

New business has tapered off, but shipments have held up fairly well. Under the new setup of prices an arbitrarily fixed switching charge for steel bars for local delivery will be placed in effect to apply both to the local producer and outside mills. This change will make the price uniform to a local consumer whether the steel is supplied by a local mill or shipped from outside. It is understood that the same method of applying a switching charge will be used where shipments are made to any other point which is a basing point for that product. Activity in the construction field is limited to a few small awards for bridges and private work. The Erie Railroad has placed 630 tons of structural steel for grade crossing elimination work in Elmira, N. Y. Public work is slow in coming out. The award of 5000 tons of plates for Cleveland water mains has been deferred pending a request for an R.F.C. loan.

Strip Steel

Specifications are holding up in fair volume but new business is light, being confined to small lots. Some of the mills withdrew outstanding quotations Monday awaiting new prices. While cold-rolled strip is unchanged, fender stock has been marked up $2 a ton to 2.95c. under the new schedule.

Scrap

With reduced mill operations and uncertainties due to the placing into effect of the iron and steel code, shipments have been either restricted or entirely suspended by mills in the Cleveland and Valley districts. There is no new demand from consumers and very little trading among dealers. Prices are unchanged.

Scrap Prices Sag at Detroit

DETROIT, Aug. 29.—The local scrap market continues lethargic, with prices showing a tendency to sag. Hydraulic bundles, sheet clippings and low phosphorus plate scrap are off 25c. a ton. However, only current distress scrap is being sold at bargain levels, dealers preferring to hold their stocks for higher prices, which they regard as an inevitable consequence of the NRA program. The local steel plant is willing to purchase scrap only at less than the present market and therefore is virtually inactive as a scrap buyer.

Fabricated Structural Steel

Lettings Higher—New Projects in Fair Volume

OF a total of 9900 tons of structural steel awarded the past week, 7625 tons is accounted for by bridges in various sections of the country, the largest being the Dover-Newington, N. H., State bridge, which will require 1800 tons. New projects of 11,200 tons are the largest for any corresponding period since the first week in July, with the exception of a week ago when requirements for the Coulee Dam were made known. The largest new job reported is 2500 tons for a distillery at Peoria, Ill., for Hiram Walker & Sons. Contracts in August totaled 61,600 tons, compared with 48,250 tons in July and 65,850 tons in June. Structural steel lettings for the week follow:

NORTH ATLANTIC STATES

Dover-Newington, N. H., 1800 tons, State bridge, to Lackawanna Steel Construction Co.

New London, Conn., 160 tons, Williams Memorial Institute, to Bethlehem Fabricators, Inc., through Topper & Griggs.

State of New York, 870 tons, highway bridges, to Lackawanna Steel Construction Corpn.

Malone, N. Y., 155 tons, State highway bridge, to Fort Pitt Bridge Works Co.

Belvidere, N. Y., 340 tons, State highway bridge, to Fort Pitt Bridge Works Co.

Elmira, N. Y., 660 tons, Erie Railroad bridges, to American Bridge Co.

Buffalo, 250 tons, school No. 37; bids about Oct. 1.

Montgomery County, Pa., 250 tons, Perkiomen Creek bridge, to Phoenix Bridge Co.

Schenley, Pa., 220 tons, J. S. Finch Co. building, to Levinson Steel Co.

Pittsburgh, 460 tons, Pittsburgh & West Virginia Railroad viaduct repairs, to Fort Pitt Bridge Works Co.

Montgomery County, Pa., 250 tons, two bridges, to Phoenix Bridge Co.

South Hills, Va., 400 tons, Roanoke River bridge, to Pittsburgh-Des Moines Steel Co.

THE SOUTH

Louisville, Ky., 410 tons, American Medical Spirits Co. distillery building, to Louisville Bridge & Iron Co.

Collingsworth County, Tex., 220 tons, highway bridge, to North Texas Iron & Steel Co., Fort Worth, Tex.

CENTRAL STATES

Coshocton, Ohio, 100 tons, Carnation Milk Co., to American Bridge Co.

Detroit, 250 tons, Chrysler Corpn. office and display building, to Whitehead & Kales Co.

Cook County, Ill., 1530 tons, highway bridge, to American Bridge Co.

Morris, Ill., 1275 tons, highway bridge, to McClintic-Marshall Corpn.

Terre Haute, Ind., 500 tons, commercial solvents plant, to Mississippi Valley structural Steel. Co.

Fort Wayne, Ind., 350 tons, Berghoff Brewing Co., to Whitehead & Kales, Detroit.

Clark County, Iowa, 400 tons, bridge to Pittsburgh-Des Moines Steel Co.

WESTERN STATES

Denver, 200 tons, seat frames for gates at Boulder dam, to John W. Beam.

Port Townsend, Wash., 120 tons, addition to mill, to Pacific Car & Foundry Co.

Seattle, 100 tons, Longacres race track, to Steel Fabricators, Inc.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Williamstown, Mass., 500 tons, State highway bridge.

Saranac Lake, N. Y., 145 tons, State highway bridge.

Dover, Del., 200 tons, State highway bridge over the St. James River.

THE SOUTH

Covington, Ky., 250 tons, Heidelberg Brewing Co. building.

State of Louisiana, 2450 tons, Western and Southern bridge and dam gates.

CENTRAL STATES

Wabash Railroad, 160 tons, grade separation at Urbana, Ill.

Peoria, Ill., 2500 tons, Hiram Walker & Sons distillery.

Peoria, 800 tons, Marquette Brewing Co.

Joliet, Ill., 700 tons, Ruby Street bridge.

Norfolk, Neb., 300 tons, bridge.

State of Missouri, 1200 tons, highway bridges.

WESTERN STATES

Boundary County, Idaho, 106 tons, bridge for Bureau of Public Roads; bids Sept. 7.

Loveland, Colo., 190 tons, State highway bridge.

Mendocino County, Cal., 145 tons, State highway bridge over Feliz Creek; bids Sept. 13.

Plumas County, Cal., 123 tons, State highway bridge over Feather River; bids Sept. 14.

State of California, 686 tons, highway bridge over Russian River near Hopland; bids Sept. 15.

Pasadena, Cal., 500 tons, Pine Canyon dam spillway gates; plans being completed.

Lane County, Ore., 217 tons, three bridges for Bureau of Public Roads; bids Sept. 7.

FABRICATED PLATE

AWARDS

Pasadena, Cal., 5080 tons, Pine Canyon dam conduit, to Consolidated Steel Corpn.

NEW PROJECTS

Fort Wayne, Ind., 200 tons, tank work for Berghoff Brewing Co.

Fort Wayne, 400 tons, tanks and heads for Centlivre Brewing Co. to be fabricated by Heil Co., Milwaukee.

San Francisco, 115 tons, 60-in. pipe for city; bids under advisement.

Reinforcing Steel

Awards 7600 Tons—New Projects 1675 Tons

Boston, 340 tons, hospital kitchen, to Barker Steel Co.

Dover-Newington, N. H., 190 tons, State bridge, to Lackawanna Steel Construction Corpn.

State of New York, 1690 tons, highway mesh, to American Steel & Wire Co., New York.

State of New York, 575 tons, highway mesh, to Kalman Steel Corpn.

Denver, 3800 tons, Bureau of Reclamation Spec. No. A-3270-A, to Pacific Coast Steel Corpn. and Colorado Fuel & Iron Products Co.

NEW REINFORCING BAR PROJECTS

Carnegie, Pa., 125 tons, bridge.

Washington, United States Bureau of Public Roads, 180 tons, highway bridges in three states; bids Sept. 7.

State of Arizona, 157 tons, four highway projects; bids Sept. 13.

State of Nevada, 100 tons, highway work in five counties; bids Sept. 12.

State of California, 239 tons, highway paving in 16 counties; bids Sept. 15.

Los Angeles County, Cal., 192 tons, State highway paving; bids Sept. 15.

Los Angeles County, 138 tons, County conduit; bids Sept. 11.

Butte County, Cal., 150 tons, State highway bridge over Feather River; bids Sept. 13.

State of California, 100 tons, bridges in four counties; bids Sept. 14.

State of California, 107 tons, highway bridge over Russian River near Hopland; bids Sept. 15.

State of Oregon, 167 tons, highway bridges in three counties; bids under advisement.

Pipe Lines

Taggart Brothers, Mecosta, Mich., operating in Mecosta natural gas fields, have secured permission for new steel pipe line to Big Rapids, Mich., where natural gas will be furnished.

Texas Corpn., 720 San Jacinto Street, Houston, Tex., plans welded steel pipe line from properties in Greta oil field district, Refugio County, Tex., to storage and distributing terminal at Corpus Christi, Tex., about 35 miles, for crude oil.

Standard Oil Co. of Louisiana, Baton Rouge, La., is considering 4-in. steel pipe line from Mandeville, La., to connection with main trunk line between Baton Rouge and Tulsa, Okla., about 13 miles, for crude oil.

Independent Utilities Co., Jackson, Miss., plans steel pipe line distribution system for natural gas service at Houston, Miss., where franchise has been granted. Work will be carried out in connection with new main trunk system, referred to in these columns last week.

City Council, Wenatchee, Wash., is considering plans for a pipe line requiring 115,600 ft. of 27-in. and 96,500 ft. of 26-in.

Gearhart, Ore., is considering plans for 7920 ft. of 8-in. wood or steel pipe.

Railroad Equipment

American Car & Foundry Co. will furnish five 40-ton commodity cars for Godfrey L. Cabot, Inc., Boston.

Alaska Railroad has awarded 318 tons of tie plates to Pacific Coast Steel Corpn.

Spelter Drops to 4.75c. a lb.—Buyers Unable to Force Quotations Lower

Straits Tin Continues to Advance on Sterling Movements—Copper Holds Firm—Lead Moderately Active

NEW YORK, Aug. 29.—Producers are booking moderate tonnages of electrolytic copper through November at a firm level of 9c. a lb., Connecticut Valley. Several custom smelters have taken scattered tonnages of first quarter metal at 9c., but despite sizable inquiry first hand producers have persistently declined to go beyond November, as provided in their code. No resale metal is pressing on the market. Current deliveries have eased up, and August stock reduction is not expected to be comparable with that of July. Brass mills are taking heavier shipments, but releases from wire fabricators have declined. The major support to the present market arises from the probability of the code soon becoming effective. If the "weighted average production cost" is permitted to establish the market level, a price rise will probably follow. Although no estimate of the "weighted cost" has been made public, several producers contend that it will fall between 12c. and 15c. a lb. The 1838-ton import rise during July compares with the 2544-ton increase in exports. These figures indicate an increased movement of bonded copper.

On the Continent the favorable world statistics failed to influence sentiment. The tendency of prices to sag, however, was more than counterbalanced by the rise occasioned by weakness in dollar exchange. Offerings rose from 8c. to 8.15c. a lb., c.i.f. usual European ports, during the week, and fair business was reported today at a representative figure of 8.25c.

Tin

As domestic quotations continue to advance, importers have begun to pick up limited offerings of metal from dealers. Erratic sterling fluctuations have hampered consumer transactions, and bookings have been light. Quotations on spot Straits have risen steadily throughout the week, and offerings were nominally made today at 46.12½c. a lb. Interest in English brands is well sustained as shown by an increasing flow of metal into this country. The London position was firm and active as Continental buying improved and a good statistical position at the end of the month was anticipated. Postings in London advanced to £219 17s. 6d. for spot Standard, £219 15s. for future Standard and £226 7s. 6d. for spot Straits. Singapore transactions were made at £224 15s. United Kingdom stocks dropped 631 tons to 17,609 tons during the week.

Lead

A flurry of bookings last Thursday and Friday served to more than move the daily intake of the major first hands. Quiet conditions prevailed yesterday, but consumers reentered the market today to take considerable prompt metal. Buyers have estimated that September requirements are more than 50 per cent covered. The steady domestic position, coupled with favorable foreign conditions, is discouraging any sudden demand for future bookings. Current purchases are limited largely to spot metal. Although October inquiry has been negligible, producers are preparing to open books for that period this week. Quotations are holding steady at 4.50c. a lb., New York, and 4.35c., St. Louis, with future weakness extremely unlikely. Buyers are forwarding releases in well-maintained volume, and first hands expect August stock reduction to be about 8000 tons.

Zinc

Scattered tonnages of spelter were moved at 4.85c., last Wednesday, but with demand light, several first hands gradually shaded quotations downward 10 points during the week. Prime Western was quoted and sold today at 4.75c. a lb., East St. Louis, for positions through October. Several consumers attempted to force bids even lower for metal beyond October, but first hands were unwilling to shade further and generally refused to consider extended action at even the 4.75c. level. It is generally believed that 4.75c. represents the low point, and that prices may harden within the next two weeks. Current sales are relatively light, but shipments continue in heavy volume. Under pressure from the falling spelter market, Joplin mines marked down ore to $34, and smelters were able to secure any desired amount at that figure.

The Twenty-Second Annual Safety Congress and Exposition of the National Safety Council is to be held at Stevens Hotel, Chicago, Oct. 2 to 6. Robert L. Schmitt, Louisville Car Wheel & Railway Suppy Co., W. H. Darr, Bethlehem Steel Co., will act as chairman and secretary, respectively, of the metals section.

The Week's Prices. Cents Per Pound for Early Delivery

	Aug. 23	Aug. 24	Aug. 25	Aug. 26	Aug. 28	Aug. 29
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, New York	9.00	9.00	9.00	9.00	9.00	9.00
Straits tin, Spot, N. Y.	44.62½	44.75	45.25	....	45.37½	46.12½
Zinc, East St. Louis	4.85	4.80	4.80	4.80	4.75	4.75
Zinc, New York	5.22	5.17	5.17	5.17	5.12	5.12
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.87½c. a lb., New York.
Brass ingots, 85-5-5-5, 9c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	47.25c. to 48.25c.
Tin, bar	49.25c. to 50.25c.
Copper, Lake	10.50c. to 11.25c.
Copper, electrolytic	10.25c. to 10.75c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	17.12½c.
*High brass sheets	14.75c.
*Seamless brass tubes	16.37½c.
*Seamless copper tubes	16.62½c.
*Brass rods	12.25c.
Zinc, slabs	6.12½c. to 7.12½c.
Zinc sheets (No. 9), casks	9.75c. to 10.00c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	7.00c. to 8.00c.
Lead, sheets	8.25c.
Antimony, Asiatic	8.50c. to 9.50c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	30.00c. to 31.00c.
Babbitt metal commercial grade	25.00c. to 50.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	48.50c.
Tin, bar	50.50c.
Copper, Lake	10.25c.
Copper, electrolytic	10.25c.
Copper, casting	10.00c.
Zinc, slab	6.00c. to 6.25c.
Lead, American pig	5.35½c. to 5.50c.
Lead, bar	8.50c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	19.00c.
Babbitt metal, high grade	53.00c.
Solder, ½ and ½	28.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.00c.	8.00c.
Copper, hvy. and wire	6.75c.	7.75c.
Copper, light and bottoms	5.75c.	6.25c.
Brass, heavy	3.75c.	4.50c.
Brass, light	3.50c.	3.75c.
Hvy. machine composition	5.25c.	6.00c.
No. 1 yel. brass turnings	5.00c.	5.625c.
No. 1 red brass or compos. turnings	5.00c.	5.50c.
Lead, heavy	3.625c.	4.00c.
Zinc	2.75c.	3.25c.
Cast aluminum	7.50c.	8.75c.
Sheet aluminum	12.00c.	13.50c.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.65c.
Del'd Philadelphia	1.91c.
Del'd New York	1.95c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Buffalo	1.70c.
F.o.b. Birmingham	1.75c.
C.i.f. Pacific ports	2.10c.

Billet Steel Reinforcing

(Cut lengths as quoted by distributors)

F.o.b. P'gh mills	1.75c.
F.o.b. Birmingham	1.75c.
F.o.b. Cleveland	1.75c. to 1.90c.
F.o.b. Chicago or Gary	1.85c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.50c.
F.o.b. Chicago Heights mills	1.55c.

Iron

Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.86c.
Common iron, del'd New York	1.90c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.65c.
F.o.b. Birmingham	1.75c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7435c.
F.o.b. Coatesville	1.70c.
F.o.b. Sparrows Point	1.70c.
Del'd New York	1.898c.
C.i.f. Pacific ports	2.10c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.65c.
F.o.b. Birmingham	1.75c.
F.o.b. Buffalo	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.8155c.
Del'd New York	1.86775c.
C.i.f. Pacific ports (standard)	2.10c.
C.i.f. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.00c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)

Alloy Quantity Bar Base. 2.45c. to 2.65c. per Lb.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
2000 (1/2% Nickel)	$0.25
2100 (2 1/2% Nickel)	0.55
2300 (3 1/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum). (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and Squares	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars forging quality. The differential for cold-drawn bars is 3/4c. a lb. higher, with standard classification for cold-finish alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

Bars, f.o.b. Pittsburgh Mill	1.95c.
Bars, f.o.b. Chicago	2c.
Bars, Cleveland	2c.
Bars, Buffalo	2c.
Bars, Detroit	2.15c.
Bars, eastern Michigan	2.20c.
Shafting, ground, f.o.b. mill, 1 1/2 in.	3.25c.
1-3/16 to 1 1/2 in.	2.75c.
1-9/16 to 1 7/8 in.	2.60c.
1-15/16 to 2 3/8 in.	2.45c.
2-15/16 to 6 in.	2.30c.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

No. 10, f.o.b. Pittsburgh	1.65c.
No. 10 f.o.b. Gary	1.75c.
No. 10, del'd Philadelphia	1.96c.
No. 10, f.o.b. Birmingham	1.80c.
No. 10, c.i.f. Pacific Coast ports	2.27 1/2c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.25c.
No. 24 f.o.b. Gary	2.35c.
No. 24, del'd Philadelphia	2.56c.
No. 24, f.o.b. Birmingham	2.40c.
No. 24, c.i.f. Pacific Coast ports	2.90c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pitts'h	2.30c.
No. 10 gage, f.o.b. Gary	2.40c.
No. 10 gage, del'd Phila.	2.61c.
No. 10 gage, del'd Pacific Coast ports	3.05c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pitts'h	2.75c.
No. 20 gage, f.o.b. Gary	2.85c.
No. 20 gage, del'd Phila.	3.06c.
No. 20 gage, del'd Pacific Coast ports	4.30c.

Fender Stock

No. 20, Pittsburgh or Cleveland	2.95c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Gary	2.95c.
No. 24, del'd Philadelphia	3.16c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, c.i.f. Pacific Coast ports	3.50c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Terne

No. 24, unassorted, 8-lb. coating f.o.b. Pittsburgh	2.90c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	2.90c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.50c.
No. 28, Gary	2.60c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	$4.25
Standard cokes, f.o.b. Gary	4.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$8.70
15-lb. coating I.C.	11.00
20-lb. coating I.C.	11.90
25-lb. coating I.C.	13.00
30-lb. coating I.C.	13.80
40-lb. coating I.C.	15.30

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 In.

	Base per Lb.
All widths up to 24 in., Pittsburgh	1.65c.
All widths up to 24 in., Chicago	1.75c.
Cooperage stock, Pittsburgh	1.75c.
Cooperage stock, Chicago	1.80c.

Cold-Rolled Strips

F.o.b. Pittsburgh	2.25c.
F.o.b. Cleveland	2.25c.
Del'd Chicago	2.55c.
F.o.b. Worcester	2.45c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

	Per Lb.
Bright wire	2.10c.
Spring wire	3.10c.

To Jobbing Trade

Extras of 10c. a 100 lb. on mixed carloads, 20c. on joint carloads and 30c. on pooled cars and less-than-carload lots are applied on all merchant wire products. In carloads and mixed carloads a discount of 10 per cent on extras is allowed.

	Base per Keg
Standard wire nails	$2.10
Smoothed coated nails	2.10
Galvanized nails	3.60

	Base per 100 Lb.
Smooth annealed wire	$2.25
Smooth galvanized wire	2.60
Polished staples	2.80
Galvanized staples	3.05
Barbed wire, galvanized	2.60
Woven wire fence, base column	55.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Wrought Iron Inches	Wrought Iron Black	Wrought Iron Galv.
1/8	51 1/2	29 1/2	1/8	+91 1/2	+138
1/4 to 3/8	57	38 1/2	1/4 & 3/8	+11 1/2	+21 1/2
1/2	62	50 1/2	1/2	31 1/2	15
3/4	65 1/2	55 1/2	3/4	36 1/2	20 1/2
1 to 3	67 1/2	58 1/2	1 & 1 1/4	39 1/2	25 1/2
			1 1/2	43 1/2	28
			2	41 1/2	26

Lap Weld

2	63 1/2	54 1/2	2	37	22 1/2
2 1/2 to 3	66 1/2	57 1/2	2 1/2 to 3 1/2	38	25
3 1/2 to 6	68 1/2	59 1/2	4 to 8	40	28 1/2
7 and 8	67 1/2	57 1/2	9 to 12	38	24 1/2
9 and 10	67	57			
11 and 12	66	56			

Butt Weld, extra strong, plain ends

1/8	48 1/2	33 1/2	1/8	+13	+45 1/2
1/4 to 3/8	54 1/2	41 1/2	1/4 & 3/8	+2 1/2	+34 1/2
1/2	60	51	1/2	32 1/2	17 1/2
3/4	64 1/2	55 1/2	3/4	37 1/2	22 1/2
1 to 3	66 1/2	58 1/2	1 to 2	43 1/2	29

Lap Weld, extra strong, plain ends

2	61 1/2	53 1/2	2	40	26
2 1/2 to 3	65 1/2	57 1/2	2 1/2 to 4	45 1/2	33
3 1/2 to 6	69	61	4 1/2 to 6	45	32 1/2
7 to 8	68	58	7 & 8	46	33
9 and 10	67	57	9 to 12	41 1/2	30
11 and 12	66	56			

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2 1/4 in.	33	1 1/2 in.	1
2 1/2 in.—2 3/4 in.	40	1 3/4 in.	8
3 in.	47	2 in.—2 1/4 in.	13
3 1/4 in.—4 3/4 in.	50	2 1/2 in.—2 3/4 in.	16
4 in.	52	3 in.	17
4 1/2 in. to 6 in.	42	3 1/4 in. to 3 1/2 in.	18
		4 in.	20
		4 1/2 in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold-Drawn

1 in.	61	3 in.	41
1 1/4 to 1 1/2 in.	53	3 1/4 to 3 1/2 in.	44
1 3/4 in.	37	4 in.	46
2 to 2 1/4 in.	27	4 1/2, 5 and 6 in.	36
2 1/2 to 2 3/4 in.	34		

Hot Rolled

2 and 2 1/4 in.	33	3 1/4 to 3 1/2 in.	50
2 1/2 and 2 3/4 in.	40	4 in.	52
3 in.	47	4 1/2, 5 and 6 in.	42

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

Rails

	Per Gross Ton
Standard, f.o.b. mill	$40.00
Light (from billets), f.o.b. mill	30.00
Light (from rail steel), f.o.b. mill	28.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.60
Spikes, 1/2-in. and smaller	2.60
Spikes, boat and barge	2.60
Tie plates, steel	1.80
Angle bars	2.55
Track bolts, to steam railroads	3.60
Track bolts, to jobbers, all sizes (per 100 count)	73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex nuts, blank or tapped	70
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh, 72 1/2, 25 and 10	
Stove bolts in packages, Ch'go, 72 1/2, 25 and 10	
Stove bolts in packages, Cleveland, 72 1/2, 25 and 10	
Stove bolts in bulk, P'gh	80
Stove bolts in bulk, Chicago	80
Stove bolts in bulk, Cleveland	80
Tire bolts	60

Large Rivets

(1/2-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.60
F.o.b. Chicago	2.60

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chi'o and Birm'g'm	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screw, 1 in. dia. and smaller	80
Milled standard set screws, case hardened, 1 in. dia. and smaller	80
Milled headless set screws, cut thread 3/4 in. and smaller	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	85 and 10
Upset set screws, sq. head	80
Milled studs	70

SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. to 6-in. inclusive Pittsburgh	$26.00
Rerolling, 4-in. to 6-in. inclusive Youngstown	26.00
Rerolling, 4-in. to 6-in. inclusive Cleveland	26.00
Rerolling, 4-in. to 6-in. inclusive Chicago	26.00
Forging quality, Pittsburgh	31.00
Forging quality, Youngstown	31.00
Forging quality, Chicago	31.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00
Chicago	26.00

Slabs

(3 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

Pig Iron, Ores, Ferroalloys

Skelp

(F.o.b. Pittsburgh, Youngstown or Chicago)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00
Cleveland	35.00
Chicago	36.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$2.50 to $2.75
Foundry, f.o.b. Connellsville Prompt	3.25 to 4.50
Foundry, by-product, Chicago ovens, for delivery outside switching districts	8.00
Foundry, by-product, delivered in Chicago switching district	8.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	8.50
Foundry, by-product, Cleveland, delivered	8.76
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal (Nominal)

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $2.00
Mine run coking coal f.o.b. W. Pa.	1.75 to 2.25
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.50
Mine run gas coal, f.o.b. Pa. mines	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines	85c. to 1.00
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.25

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	3.73c.
No. 5 industrial fuel oil	3.23c.

Per Gal. f.o.b. Cleveland

No. 3 distillate	5.50c.
No. 4 industrial	5.00c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	55.00	43.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Chrome Brick

	Per Net Ton
Standard size	$45.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	$65.00
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$43.40 to $44.40
4-in., del'd Chicago	46.40 to 47.40
6-in., and larger, del'd New York	38.30
4-in., del'd New York	41.30
6-in., and larger, Birmingham,	$35.00 to 36.00
4-in., Birmingham	38.00 to 39.00

Class "A" and gas pipe, $3 extra

VALLEY

Per Gross ton f.o.b. Valley furnace:

Basic	$17.00
Bessemer	18.00
Gray forge	17.50
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Low phos., copper free	25.00

Freight rate to Pittsburgh or Cleveland district, $1.89.

PITTSBURGH

Per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$17.50
No. 2 foundry	18.00
No. 3 foundry	17.50
Malleable	18.00
Bessemer	18.50

Freight rates to points in Pittsburgh district range from 69c. to $1.26.

CHICAGO

Per gross ton at Chicago furnaces:

N'th'n No. 2 fdy.	$17.50
N'th'n No. 1 fdy.	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Bessemer	18.00
Basic	17.00
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	$16.14 to 17.14
Low. phos., sil. 1 to 2, copper free.	25.00
Silvery, sil. 8 per cent	29.17
Bess. ferrosil'n, 15 per cent	38.67

Prices are delivered consumers' yards except on Northern foundry, high phosphorous and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$17.00
Del'd St. Louis	17.85
Malleable, f.o.b. Granite City	17.50
Southern fdy., sil. 1.75 to 2.25 del'd St. Louis	17.35

Freight rates, 83c (average) Granite City to St. Louis; $2.30 from Chicago; $4.56 from Birmingham.

NEW YORK

Per Gross ton, delivered New York district:

*Buffalo, No. 2, del'v'd eastern N. J.	$19.02 to $20.02
*Buffalo malleable, del'v'd eastern N. J.	19.52 to 20.52
East Pa. No. 2 fdy. del'v'd eastern N. J.	19.02 to 19.52

Freight rates: $1.52 to $2.63 from eastern Pennsylvania.

BUFFALO

Per gross ton, f.o.b. furnace:

*No. 2 fdy.	$17.50
Malleable, sil. up to 2.25	18.00
Basic	16.50
Lake Superior charcoal, del'd	25.41

*Each increase of 25 points of silicon above base foundry grade takes 25c. extra.

CINCINNATI

Per gross ton, delivered Cincinnati

Ala. fdy., sil. 1.75 to 2.25	$18.23
Tenn. fdy., sil. 1.75 to 2.25	18.23
N'th'n No. 2 foundry	18.63
S'th'n Ohio silvery, 8%	26.14

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.82 from Birmingham

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n No. 2 fdy.	$17.50
Malleable	17.50
Ohio silvery, 8 per cent	27.37
Stand. low. phos., Valley	25.00
Southern No. 2 fdy.	17.14

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates; 63c. average local switching charge; $3.12 from Jackson, Ohio; $6.14 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

*East. Pa. No. 2	$18.34
Basic (del'd east Pa.)	17.84
Malleable	18.84
Stand. low phos. (f.o.b. east. Pa. furnace)	22.00
Con. b'r'g low phos. (f.o.b. furnace)	22.00

Prices, except as specified otherwise, are delv'd Philadelphia. Freight rates 84c. to $1.79 from eastern Pennsylvania furnaces.

*Each increase of 25 points of silicon above base grade takes 25c extra.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:

No. 2 fdy., 1.75 to 2.25 sil.	$13.50
Basic	13.50

NEW ENGLAND

Per gross ton delivered Boston and nearby New England points:

Mystic, sil. 1.75 to 2.25	$19.50
Buffalo, sil. 1.75 to 2.25	19.50
Ala., sil. 1.75 to 2.25	18.00

CANADA

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard, (carloads)	$82.00
Domestic, 80%, seaboard, (less carloads)	89.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$27.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads)	31.00
14% to 16% (less carloads)	36.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$22.25	12%	$29.25
7%	23.25	13%	30.75
8%	24.25	14%	32.25
9%	25.25	15%	33.75
10%	26.25	16%	35.25
11%	27.75	17%	36.75

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$26.25	14%	$32.25
11%	27.75	15%	33.75
12%	29.25	16%	35.25
13%	30.75	17%	36.75

Manganese 1½ to 3%. $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.65% or over, $1 a ton additional.

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	94c.
Ferrotungsten, less carloads	$1.00
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del., per lb. contained Va.	$2.60 to 2.80
Ferrocarbontitanium, 15 to 18% per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorous, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.5% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorous, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c.
Iron, low phos., Swedish, average 64½% iron	8.50c.
Iron, basic or foundry, Swedish, average, 65% iron	8c.
Iron, basic or foundry, Russian, aver. 65% iron (nom.)	8c.
Manganese, Caucasian, washed 52%	22c.
Manganese, African, Indian, 44-48%	20c.
Manganese, African, Indian, 49-51%	21c.
Manganese, Brazilian, 46 to 48%	17c.

	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid*	$12.00
Tungsten, domestic scheelite*	$11.00 to $12.00

	Per Gross Ton
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	16.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic seaboard	18.00

*Quotations nominal in absence of sales.

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines	$15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.90
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$13.50 to $14.00
No. 2 heavy melting steel	12.00 to 12.50
No. 2 railroad wrought	13.50 to 14.00
Scrap rails	13.50 to 14.00
Rails 3 ft. and under	15.50 to 16.00
Sheet bar crops, ordinary	14.50 to 15.00
Compressed sheet steel	13.25 to 13.75
Hand bundled sheet steel	12.25 to 12.75
Hvy. steel axle turnings	12.00 to 12.50
Machine shop turnings	10.50 to 11.00
Short shov. steel turnings	10.50 to 11.00
Short mixed borings and turnings	9.75 to 10.25
Cast iron borings	9.75 to 10.25
Cast iron carwheels	13.00 to 13.50
Heavy breakable cast	10.25 to 10.75
No. 1 cast	11.50 to 12.00
Rel't. knuckles and couplers	15.50 to 16.00
Rail, coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
Low phos. billet crops	17.00 to 17.50
Low phos. sheet bar crops	15.50 to 16.00
Low phos. plate scrap	15.00 to 15.50
Low phos. punchings	15.50 to 16.00
Steel car axles	16.00 to 16.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$10.00 to $10.50
Shoveling steel	10.00 to 10.50
Hydraulic comp. sheets	$8.50 to $9.00
Drop forge flashings	8.50 to 9.00
No. 1 busheling	8.75 to 9.25
Rolled carwheels	11.50 to 12.00
Railroad tires	11.25 to 12.25
Railroad leaf springs	11.50 to 12.00
Axle turnings	8.50 to 9.00
Steel couplers and knuckles	11.00 to 11.50
Coil springs	11.75 to 12.25
Axle turnings (elec. fur.)	8.50 to 9.00
Low phos. punchings	12.00 to 12.50
Low phos. plates, 12 in. and under	12.00 to 12.50
Cast iron borings	6.50 to 7.00
Short shoveling turnings	6.50 to 7.00
Machine shop turnings	6.00 to 6.50
Rerolling rails	12.00 to 12.50
Steel rails, less than 3 ft.	11.75 to 12.25
Steel rails, less than 2 ft.	12.50 to 13.00
Angle bars steel	11.50 to 12.00
Cast iron carwheels	10.50 to 11.00
Railroad malleable	10.50 to 11.00
Agricultural malleable	8.50 to 9.00

Per Net Ton

Iron car axles	$12.50 to $13.00
Steel car axles	11.50 to 12.00
No. 1 railroad wrought	9.00 to 9.50
No. 2 railroad wrought	9.00 to 9.50

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No. 2 busheling	$4.00	to $4.50
Locomotive tires, smooth	9.00	to 9.50
Pipe and flues	4.75	to 5.25
No. 1 machinery cast	10.50	to 11.00
Clean automobile cast	10.00	to 10.50
No. 1 railroad cast	10.00	to 10.50
No. 1 agricultural cast	8.75	to 9.25
Stove plate	7.75	to 8.25
Grate bars	6.75	to 7.25
Brake shoes	9.75	to 10.25

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$12.00	
No. 2 heavy melting steel	$10.00	to 10.50
No. 1 railroad wrought	....	12.00
Bundled sheets	8.50	to 9.00
Hydraulic compressed, new	10.50	to 11.00
Hydraulic compressed, old	8.50	to 9.00
Machine shop turnings	....	8.00
Heavy axle turnings	10.00	to 10.50
Cast borings	....	7.00
Heavy breakable cast	10.00	to 10.50
Stove plate (steel works)	....	9.50
No. 1 low phos. heavy	....	15.00
Couplers and knuckles	....	14.00
Rolled steel wheels	....	14.00
No. 1 blast furnace	....	7.00
Spec. iron and steel pipe	10.00	to 10.50
Shafting	15.00	to 15.50
Steel Axles	15.00	to 15.50
No. 1 forge fire	....	10.50
Cast iron carwheels	12.50	to 13.00
No. 1 cast	12.00	to 13.00
Cast borings (chem.)	10.00	to 10.50
Steel rails for rolling	12.00	to 12.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$11.00	to $11.25
No. 2 heavy melting steel	10.50	to 10.75
Compressed sheet steel	10.00	to 10.50
Light bundled sheet stampings	6.50	to 7.00
Drop forge flashings	10.00	to 10.50
Machine shop turnings	7.50	to 8.00
Short shoveling turnings	8.00	to 8.50
No. 1 busheling	10.00	to 10.50
Steel axle turnings	7.50	to 8.00
Low phos. billet crops	12.50	to 13.00
Cast iron borings	7.75	to 8.25
Mixed borings and short turnings	7.75	to 8.25
No. 2 busheling	7.75	to 8.00
No. 1 cast	11.00	to 11.50
Railroad grate bars	6.50	to 7.00
Stove plate	7.50	to 8.00
Rails under 3 ft.	10.00	to 10.50
Rails for rolling	10.50	to 11.00
Railroad malleable	10.00	to 10.50
Cast iron carwheels	....	11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$10.50	to $11.00
No. 2 heavy melting scrap	10.00	to 10.50
Scrap rails	8.75	to 9.25
New hydraul. comp. sheets	10.00	to 10.50
Old hydraul. comp. sheets	9.50	to 10.00
Drop forge flashings	10.00	to 10.50
No. 1 busheling	10.00	to 10.50
Hvy. steel axle turnings	8.50	to 9.00
Machine shop turnings	6.50	to 7.00
Knuckles and couplers	11.50	to 12.00
Coil and leaf springs	11.50	to 12.00
Rolled steel wheels	11.50	to 12.00
Low phos. billet crops	12.50	to 13.00
Short shov. steel turnings	7.00	to 7.50
Short mixed borings and turnings	7.00	to 7.50
Cast iron borings	6.50	to 7.00
No. 2 busheling	6.00	to 6.50
Steel car axles	11.00	to 12.00
Iron axles	11.00	to 12.00
No. 1 machinery cast	11.25	to 12.25
No. 1 cupola cast	11.00	to 12.00
Stove plate	8.75	to 9.25
Steel rails, 3 ft. and under	13.50	to 14.00
Cast iron carwheels	10.00	to 10.50
Industrial malleable	11.50	to 12.00
Railroad malleable	12.00	to 12.50
Chemical borings	7.50	to 8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	....	$11.00
Scrap steel rails	....	10.00
Short shoveling turnings	....	5.50
Stove plate	$7.00	to 7.50
Steel axles	11.00	to 11.50
Iron axles	11.00	to 11.50
No. 1 railroad wrought	7.00	to 7.50
Rails for rolling	....	11.50
No. 1 cast	....	10.50
Tramcar wheels	....	10.00
Cast iron borings, chem.	....	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$9.75	to $10.25
No. 1 heavy melting	9.00	to 9.50
No. 2 heavy melting	8.25	to 8.75
No. 1 locomotive tires	7.50	to 8.00
Misc stand.-sec. rails	10.00	to 10.50
Railroad springs	10.00	to 10.50
Bundled sheets	6.00	to 6.50
No. 2 railroad wrought	9.00	to 9.50
No. 1 busheling	4.75	to 5.25
Cast iron borings and shoveling turnings	4.50	to 5.00
Rails for rolling	10.50	to 11.00
Machine shop turnings	4.50	to 5.00
Heavy turnings	4.50	to 5.00
Steel car axles	10.00	to 10.50
Iron car axles	11.00	to 11.50
Wrot. iron bars and trans.	9.00	to 9.50
No. 1 railroad wrought	6.50	to 7.00
Steel rails less than 3 ft.	11.50	to 12.00
Steel angle bars	10.00	to 10.50
Cast iron carwheels	8.50	to 9.00
No. 1 machinery cast	8.50	to 9.00
Railroad malleable	9.00	to 9.50
No. 1 railroad cast	8.50	to 9.00
Stove plate	7.00	to 7.50
Relay rails, 60 lb. and under	16.00	to 16.50
Relay rails, 60 lb. and over	$20.00	to $21.00
Agricult. malleable	6.00	to 6.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$7.00	to $7.50
Scrap T rails	6.75	to 7.25
Machine shop turnings	4.00	to 4.25
Cast iron borings	4.00	to 4.25
Bundled skeleton, long	5.50	to 6.00
Forge flashings	4.75	to 5.00
Blast furnace scrap	4.75	to 5.00
Shafting	9.00	to 9.50
Steel car axles	8.50	to 9.00
Wrought pipe	3.50	to 4.00
Rails for rerolling	6.00	to 6.50
Cast iron borings, chemical	10.00	to 10.50

Per gross ton delivered consumers' yards:

Textile cast	$10.00	to $10.25
No. 1 machinery cast	10.00	to 10.25
Stove plate	6.25	to 6.50
Railroad malleable	11.00	to 12.00

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$7.00	to $8.00
No. 2 heavy melting steel	6.75	to 7.00
Unprepared yard iron and steel	4.00	to 4.50
No. 1 heavy breakable cast	6.00	to 6.25
Stove plate (steel works)	5.00	to 5.50
Machine shop turnings	4.00	to 4.50
Short shoveling turnings	4.00	to 4.50
Cast borings	4.50	to 4.75
No. 1 blast furnace	4.00	to 4.25
Steel car axles	10.00	to 10.50
Spec. iron and steel pipe	$4.50	to $5.00
Forge fire	5.50	to 6.00
No. 1 railroad wrought	6.50	to 7.00
No. 1 yard wrought, long	4.50	to 5.00
Rails for rolling	7.50	to 8.00
No. 1 cast	6.50	to 7.00
No. 2 cast	5.50	to 6.50
Stove plate (foundry)	6.00	to 6.50
Cast borings (chemical)	10.00	to 10.50

Per gross ton, delivered local foundries:

No. 1 machinery cast	$11.00	
No. 1 hvy. cast (cupola size)	9.00	
No. 2 cast	7.00	

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$9.50	to $10.00
Scrap rails for melting	9.25	to 9.75
Loose sheet clippings	5.00	to 5.50
Bundled sheets	6.00	to 6.50
Cast iron borings	6.00	to 6.50
Machine shop turnings	5.50	to 6.00
No. 1 busheling	7.00	to 7.50
No. 2 busheling	3.50	to 4.00
Rails for rolling	9.75	to 10.25
No. 1 locomotive tires	8.50	to 9.00
Short rails	11.50	to 12.00
Cast iron carwheels	8.50	to 9.00
No. 1 machinery cast	9.50	to 10.00
No. 1 railroad cast	9.00	to 9.50
Burnt cast	7.00	to 7.50
Stove plate	7.00	to 7.50
Agricultural malleable	8.75	to 9.25
Railroad malleable	9.25	to 9.75

DETROIT

Dealers' buying prices per gross ton:

Hvy. melting steel	$9.00	to $9.50
Borings and short turnings	6.75	to 7.25
Long turnings	6.00	to 6.50
No. 1 machinery cast	8.50	to 9.00
Automotive cast	10.00	to 10.50
Hydraul. comp. sheets	9.00	to 9.50
Stove plate	6.00	to 6.50
New factory busheling	7.75	to 8.25
Old No. 2 busheling	5.75	to 6.25
Sheet clippings	6.00	to 6.50
Flashings	7.00	to 7.50
Low phos. plate scrap	10.00	to 10.50

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$5.50	$5.50
Rails, scrap	6.00	4.50
Machine shop turnings	2.50	2.50
Boiler plate	4.50	4.50
Heavy axle turnings	2.50	2.50
Cast borings	3.00	3.00
Steel borings	2.00	2.00
Wrought pipe	2.50	2.50
Steel axles	4.50	6.00
Axles, wrought iron	4.50	6.50
No. 1 machinery cast	7.75	9.00
Stove plate	4.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands, under ¼ in.	2.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.50c.
Hot-rolled sheets (No. 10)	2.50c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.32
Spikes, large	2.40c.
Small	2.65c.
Boat	2.90c.
Track bolts, all sizes, per 100 count,	70 per cent off list.
Machine bolts, 100 count,	70 per cent off list.
Carriage bolts, 100 count,	70 per cent off list.
Nuts, all styles, 100 count,	70 per cent off list.
Large rivets, base per 100 lb.	$3.25
Wire, black, soft ann'l'd, base per 100 lb.	2.90
Wire, galv. soft, base per 100 lb.	3.35
Common wire nails, per keg	2.45
Cement coated nails, per keg	2.45

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Rein. bars, billet steel	1.85c.
Rail steel reinforcement	1.80c.
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.25c.
Flats and squares	3.25c.
Bands, 3/16 in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.45c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	2.85c.
Spikes (3/16 in. and lighter)	3.45c.
Track bolts	4.30c.
Rivets, structural (keg lots)	3c.
Rivets, boiler (keg lots)	3c.
	Per Cent Off List
Machine bolts	65
Carriage bolts	65
Coach and lag screws	65
Hot-pressed nuts, sq., tap. or blank.	65
Hot-pressed nuts, hex., tap. or blank.	65
Hex. head cap screws	80 and 10
Cup point set screws	75
Flat head bright wood screws	50 and 10
Spring cotters	60 and 10
Stove bolts	80
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	$5.50 off list
No. 8 black ann'l'd wire per 100 lb.	$3.45
Com. wire nails, base per keg	2.55
Cement c't'd nails, base per keg	2.55

NEW YORK

	Base per lb.
Plates and struc. shapes	3.10c.
Soft steel bars, small shapes	3.10c.
Iron bars	3.24c.
Iron bars, swed. charcoal	6.00c. to 6.50c.
Cold-fin. shafting and screw stock;	
Rounds and hexagons	3.79c.
Flats and squares	4.29c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.30c.
Bands	3.30c.
Hot-rolled sheets (No. 10)	3.00c.
Hot-rolled ann'l'd sheets (No. 24*)	3.65c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	4.50c.
Standard tool steel	12.00c.
Wire, black annealed (No. 10)	3.60c.
Wire, galv. annealed (No. 10)	4.05c.
Tire steel ½ x ¾ in. and larger, Smooth finish, 1 to 2½ x ¼ in. and larger	3.40c. 3.75c.
Open hearth spring steel, bases	4.50c. to 7.00c.
Common wire nails, base, per keg	$2.90
	Per Cent
Machine bolt, cut thread:	Off List
¾ x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65 to 65 and 10
¾ x 20 in. and smaller	65 to 65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.95
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.61c.
Hot-rolled annealed sheets (No. 24)	3.60c.
Galv. sheets (No. 24)	4.25c.
Hot-rolled sheets (No. 10)	3.10c.
Black corrug. sheets (No. 24)	3.65c.
Galv. corrug. sheets	4.30c.
Structural rivets	3.25c.
Boiler rivets	3.25c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller, 100 lb. or more	65
Less than 100 lb.	65
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts, sq. blank or tapped, 200 lb. or more	65
Less than 200 lb.	55
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	65
Less than 200 lb.	55

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.60c.
*Structural shapes	2.60c.
*Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform.	2.30c.
Cold-finished steel bars	3.60c.
*Steel hoops	3.15c.
*Steel bands, No. 12 to 3/16 in., incl.	2.90c.
Spring steel	5.00c.
†Hot-rolled annealed sheets (No. 24)	3.30c.
†Galvanized sheets (No. 24)	3.75c.
*Hot-rolled annealed sheets (No. 10)	2.75c.
Diam. pat. floor plates, ¼ in.	4.35c.
Swedish iron bars	6.00c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deductions on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 2.35c.
Cold-fin. steel bars:	
Rounds, squares, hexagons	3.25c.
Flats	3.40c.
Flat rolled steel under ¼ in.	3.00c.
Cold-finished strip	5.55c.
Hot-rolled annealed sheets (No. 24)	3.25c.
Galvanized sheets (No. 24)	3.85c.
Hot-rolled sheets (No. 10)	2.75c.
Black ann'l'd wire, per 100 lb.	$2.55
No. 9 galv. wire, per 100 lb.	2.90
Com. wire nails, base per keg	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rail steel reinforc. bars	3.00c.
Hoops	3.75c.
Bands	3.20c.
Cold-finished bars	3.57c.
Hot-rolled annealed sheets (No. 24)	3.60c.
Galv. sheets (No. 24)	4.15c.
Hot-rolled sheets (No. 10)	3.00c.
Structural rivets	4.00c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 49 kegs)	3.00
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.85
Chain, 1-in., per 100 lb.	7.15
	Net per 100 P.
Seamless steel boiler tubes, 2-in.	$16.57
4-in.	37.00
Hot-welded steel boiler tubes, 2-in.	15.70
4-in.	34.80

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	2.95c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.00c.
Rounds and hex.	3.00c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.25c.
Galv. sheets (No. 24)	4.00c.
Bands	3.30c.
Hoops	3.55c.
Hot-rolled unannealed sheets	3.10c.
Com. wire nails, base per keg	$2.75
Black wire, base per 100 lb.	3.25

BOSTON

	Per Lb.
*Beams, channels, angles, tees, zees	2.75c.
*H beams and shapes	2.75c.
*Plates—sheared, tank and universal mill, ¾ in. thick and heavier	2.75c.
*Floor plates, diamond pattern	4.65c.
*Bar and bar shapes (mild steel)	2.65c.
*Bands 3/16 in. thick and No. 12 ga. incl.	3.15c. to 3.65c.
Hoops, No. 14 ga. and lighter	4.90c. to 5.40c.
*Half rounds, half ovals, ovals and bevels	3.90c.
Tire steel, rd. edge 1½ x ½ in. and larger	4.50c.
Smaller sizes	4.75c.
Cold-finished rounds and hexagons	3.75c.
Cold-rolled strip steel	5.25c.
Cold-finished squares and flats	3.65c.
*Blue annealed sheets, No. 10 ga.	2.65c.
One pass cold-rolled sheets No. 24 ga.	3.50c.
Blued stove pipe sheets, No. 24 ga.	3.90c.
Galvanized steel sheets No. 24 ga.	4.00c.
Lead coated (long ternes) No. 24 ga.	5.00c.

Base prices for 40,000 lb. orders; extra apply for smaller quantities.

PACIFIC COAST

	San Francisco	Los Angeles	Seattle	Base per Lb.
Plates, tank and U.M.	3.35c.	3.30c.	3.35c.	
Shapes, standard	3.35c.	3.30c.	3.35c.	
Wide-flanged beams and columns	3.45c.	3.45c.	3.50c.	
Soft steel bars	3.35c.	3.30c.	3.35c.	
*Reinforcing bars	2.90c.	3.00c.	3.00c.	
Hot-rolled annealed sheets (No. 24)	4.15c.	4.05c.	4.50c.	
Hot-rolled sheets (No. 10)	3.53c.	3.45c.	3.75c.	
Galv. sheets (No. 24)	4.75c.	4.65c.	5.00c.	
*Struc. rivets, ½ in. and larger	5.75c.	6.00c.	5.25c.	
*Cold-finished steel Rounds	5.85c.	5.85c.	3.75c.	
Squares and hexagons	7.10c.	7.10c.	7.00c.	
Flats	7.60c.	7.60c.	8.00c.	
Common wire nails —base per keg	$2.80	$2.90	$2.75	
less carload				

*Subject to deductions for quantity.

Organizes National Weld Testing Bureau

THE Pittsburgh Testing Laboratory, Pittsburgh, has announced the organization of a welding division, to be known as the National Weld Testing Bureau, with James W. Owens, consulting welding engineer, director.

The bureau proposes to render complete welding service along six separate lines. These are: Reports on welding processes; reports on weld specimens prior to construction (frequently termed "qualification of welders"); reports on weld specimens during construction; laboratory tests of weld specimens; inspection of welded products and structures; and investigation of special welding problems. The first three services are intended to assist manufacturers, fabricators and others to comply with the requirements of weld testing as embodied in numerous specifications, codes or rules or recommended practices relating to new welded construction and to repairs by means of welding.

It is stated in the preliminary bulletin describing these services, that the Bureau does not propose to set up weld testing standards of its own, but will adhere to those of the American Welding Society and other recognized bodies. Furthermore, the service is to be neutral as regards the welding process, type or make of equipment or the class of material, base or filler metal, sold or used by the individual or company subscribing to the service.

A PORCELAIN enameled, pressed steel sink stamped from a single piece of sheet steel is now being made by the Youngstown Pressed Steel Co., Warren, Ohio. Under the trade name Veos (vitreous enamel on steel) the sink is manufactured in six models and 20 different sizes. It can easily be installed by one man, as shown above, the largest size (60 in. long) weighing only 70 lb. No extra charge is made for the acid-resisting enamel. The company is also developing other steel sanitary ware as logical replacements of existing heavy plumbing fixtures.

Babbitt Production Up in July

WASHINGTON, Aug. 22.—The production of babbitt metal in July rose to 2,484,992 lb. from 2,327,843 lb. in June, according to reports received by the Bureau of the Census from 39 manufacturers. Sales increased to 1,941,080 lb. from 1,877,731 lb. The output in the first six months of 1933 totaled 12,126,376 lb. compared with 10,276,352 lb. in the corresponding period of last year. Sales aggregated 9,808,723 lb. and 7,349,397 lb., respectively.

Coke Output Declined 35 Per Cent in 1932

PRODUCTION of both beehive and by-product coke totaled only 21,912,511 net tons in 1932, the lowest output since 1901, and a decrease of 34.6 per cent from 1931, according to the Bureau of Mines. Most of the decline in 1932, as in the two preceding years, was accounted for by reduced activity in the metallurgical industries. By-product ovens contributed 97 per cent of the total production in 1932, virtually the same proportion as in 1931. Activity of beehive ovens declined even more in proportion than that of by-product plants. Production amounted to 653,563 tons in 1932, a decrease of 42.1 per cent from 1931. Of particular significance is the growing demand for coke for domestic use. While other uses of coke have shown marked declines during the depression, sales of domestic coke have increased each year to 9,457,259 tons in 1932, a gain of 11.3 per cent over 1931.

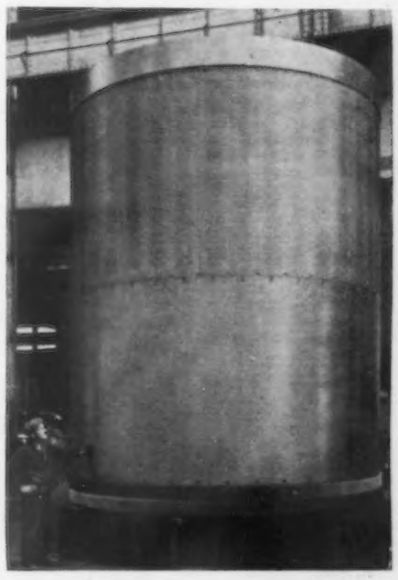
Volume three of the series of "The Story of Hoover (Boulder) Dam" booklets has been published by the Ingersoll-Rand Co., 11 Broadway, New York. It describes the railroad system, the gravel-treating and concrete mixing plants and the lining of the diversion tunnels with concrete. A general account of the Colorado River Aqueduct is also included.

Recovery of Secondary Metals Fell in 1932

The total tonnage of major nonferrous metals recovered from secondary sources in the United States was 545,350 tons in 1932, as compared with 720,770 tons in 1931. There was a decline in total market value of $45,651,800, which was due partly to lower average market prices for metals, according to a report of the United States Bureau of Mines.

In 1932 copper recovered amounted to 187,700 tons, which was a decline from 1931 of 73,300 net tons. Brass scrap remelted decreased 36,400 tons, and lead recovered amounted to 198,300 tons, as compared with 234,700 tons in 1931. Detinning plant activity was comparatively well sustained in 1932, with a yield of 14,750 tons and a market return of $6,248,100. The quantity of zinc used for galvanizing declined so drastically in 1932 that drosses were scarce and redistilled zinc production decreased 6900 tons.

ONE of two huge lifting-hoist drums, the largest of their kind ever built, for a cableway which is now under construction at Hoover Dam. The cableway, designed to carry weights up to 150 tons, is to be a permanent installation and will be used for handling equipment and supplies between the top of the river gorge and the dam, a distance of approximately 600 ft. Each of the two drums was rolled from steel plate 2 in. thick, 42 ft. long, and 8 ft. wide. The drums weigh 90,000 lb. apiece, and will be wound with more than a mile of 1⅛-in. wire rope. General Electric arc welding machines and electrodes were used to weld the seams and internal strengthening structure of the drum.



PLANT EXPANSION AND EQUIPMENT BUYING

NEW ENGLAND

Armstrong Rubber Co., West Haven, Conn., manufacturer of automobile tires, tubes, etc., has plans for two and three-story addition, 80 x 180 ft., for storage and distribution. Cost about $30,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, Bridgeport, Conn., is architect and engineer.

Worcester Brewing Co., Worcester, Mass., plant, inactive for several years, heretofore held by Worcester Products Co., has been acquired by new interests. Expansion and improvements will be made, to include new equipment. Cost over $150,000 with machinery.

General Body & Hoist Co., Everett, Mass., has been organized by Gerald S. Connolly, 315 Tappan Street, Brookline, Mass., and associates, capital $100,000, to manufacture motor truck bodies, hoists and kindred equipment.

E. W. Wiggins Airways, Metropolitan Airport, Canton, Mass., has plans for new one-story hangar, 70 x 70 ft., with repair and reconditioning facilities.

Landers, Frary & Clark, 47 Center Street, New Britain, Conn., manufacturer of cutlery, electric household appliances, etc., has let general contract to H. Wales Lines Co., Meriden, Conn., for one-story addition, 40 x 207 ft. Cost over $40,000 with equipment. W. F. Brooks, Lewis and Gold Streets, Hartford, Conn., is architect.

Gloucester Yacht Yards, Inc., Gloucester, Mass., has been organized by Ralph B. Waldron, 55 Rockway Avenue, Marblehead, Mass., and associates, to operate a boat-building and repair plant.

Apothecaries Hall Co., Waterbury, Conn., manufacturer of platers' and industrial chemicals, etc., plans rebuilding part of plant at Broad Brook, recently destroyed by fire. Loss over $100,000 with equipment.

NORTH ATLANTIC

General Cable Corpn., 420 Lexington Avenue, New York, manufacturer of copper and aluminum cable, wires, etc., has leased property at Ninth and Esperanza Streets, Los Angeles, for one-story branch plant, about 160 x 300 ft., to cost over $200,000 with equipment. Initial production will be given over to copper cable for 271-mile transmission line for Bureau of Water and Power, Los Angeles.

Brooklyn Bottling & Distributing Co., Inc., DeKalb Avenue and Lewis Street, Brooklyn, will take bids soon on general contract for five-story brewing plant, 81 x 200 ft. Cost about $300,000 with equipment. Koch & Wagner, 32 Court Street, are architects.

Van Yahres Corpn., Westbury, L. I., has been organized by Marcelle and George Van Yahres, Westbury, and Algwyne Collins, Great Neck, L. I., capital $100,000, to manufacture plows, harrows, mowing machines, parts, etc.

Edward & John Burke, Ltd., 47-24 Twenty-fourth Street, Long Island City, brewer, is purchasing equipment for new three-story brewing and bottling plant, 95 x 151 ft., and one-story storage and distribution unit, 67 x 120 ft., for which superstructure was recently begun. Cost over $200,000 with equipment. W. S. Kinnear & Co., 50 Church Street, New York, are engineers.

DuPont Rayon Co., 350 Fifth Avenue, New York, manufacturer of cellulose rayon products, plans extensions and improvements in mill at Old Hickory, Tenn., including new equipment; addition will be built to power plant and new machinery installed. Cost about $2,000,000 with equipment.

Empire Shipbuilders, Inc., New York, has been organized by Job Hutchinson, Colony House Hotel, Great Neck, L. I., and associates, capital $100,000, to operate a shipbuilding and repair works.

Continental Can Co., 1 Pershing Square, New York, has let general contract to Austin Co. of California, Inc., Oakland, Cal., for new two-story plant at San Jose, Cal., 180 x 220 ft., with L-extension, 80 x 120 ft. Cost about $200,000 with equipment. Pacific coast headquarters are at 155 Montgomery Street, San Francisco.

Standard Brands, Inc., 595 Madison Avenue, New York, has organized Fleischmann Distilling Corpn., capital $1,000,000, as new subsidiary, to erect distilleries in different parts of country. New company will carry out manufacture of liquor products at plant at Peekskill, N. Y., where two-story and basement addition, 80 x 170 ft., will be built, to cost over $80,000 with equipment. Joseph Wilshire and Paul W. Fleischmann, address noted, head new subsidiary.

Hart, Cooley & Highton Co., New Britain, Conn., manufacturer of draft regulators, registers, etc., has formed Tuttle & Bailey, Inc., new subsidiary, to take over Tuttle-Bailey Mfg. Co., North Tenth and Berry Streets, Brooklyn, manufacturer of metal grilles, registers and parts, recently acquired. Production will be continued at last noted plant.

Great Eastern Breweries, Inc., 92-94 Main Street, Manville, N. J., recently organized, has purchased 125 lots at East Manville for new six-story plant, with two two-story wing additions and power plant. Cost over $350,000 with equipment. B. Sumner Gruzen, 972 Madison Avenue, New York, is architect. George E. Halliday, formerly general manager at Manville works of Johns-Manville Corpn., is president.

Board of Essex County Freeholders, Hall of Records, Newark, N. J., plans extensions in power plant at Overbrook Hospital, Verona, N. J., including two new generating units and auxiliary equipment, pipe line for water supply, etc. Cost over $125,000 with equipment.

Wallraff Appliances & Sales Co., Hillside, N. J., has been organized by Louis E. Wallraff, 1449 Munn Avenue, and associates, capital $125,000, to manufacture electrical and heating equipment and appliances.

J. F. Trommer, Inc., 1632 Bushwick Avenue, Brooklyn, is purchasing equipment for branch brewery at Orange, N. J., where work is under way on expansion and improvements. Cost about $400,000 with equipment.

Interstate Bronze Arts, Inc., Newark, N. J., has been organized by David Wilken and Leslie S. Kohn, care of Abraham Rudensky, 24 Commerce Street, representative, to manufacture bronze and brass products.

Joseph Stokes Rubber Co., Taylor and Webster Streets, Trenton, N. J., manufacturer of molded hard rubber products, has let general contract to N. A. K. Bugbee & Co., Inc., 206 East Hanover Street, for one-story addition, 60 x 100 ft.

Continental Distilling Corpn., Snyder and Swanson Streets, Philadelphia, let general contract to S. H. Levin, 1619 Sansom Street, for new plant unit, to be used as a tank house. Cost over $100,000 with tanks and equipment.

Yorktown Breweries, Inc., Broad and Walnut Streets, York, Pa., plan extensions and improvements, to include new equipment. Cost over $150,000 with machinery.

Bancroft-Hickey Mfg. Co., Wayne Avenue and Berkley Street, Philadelphia, manufacturer of grinding materials and equipment, has leased factory at Bristol, Pa., for new plant.

New Lebanon Brewery, North Seventh Street, Lebanon, Pa., has been acquired by new interests, headed by Jacob Kosloff, Reading, Pa. Plant will be expanded and modernized, including equipment. Cost about $75,000 with machinery. Company will be organized to carry out project.

School Board, Claymont, Del., plans addition to south wing of Claymont school, for manual training department. Cost about $75,000 with equipment. State Board of Education, Wilmington, Del., will be in charge.

Christian Feigenspan Brewing Co., 50 Freeman Street, Newark, N. J., let contract to Michael Stefany, 246 Fabyan Place, for three-story addition for bottling works. Cost over $175,000 with equipment. Clarence E. Wunder, Architects Building, Philadelphia, is architect.

SOUTH ATLANTIC

American Consolidated Tin Mines Corpn., 120 Liberty Street, New York, plans early erection of new tin mill on ore properties near Lincolnton, N. C., where about 650 acres has been secured. Cost about $130,000 with equipment. Company will also carry out development program for mining raw material, with steam shovel operations.

Construction Service, Veterans' Administration, Washington, asks bids until Sept. 5 for new shops, and addition to storage and distributing building at institution at St. Petersburg, Fla.

Common Council, Hamilton, Ga., plans installation of an elevated steel tank and tower for new municipal water system. Entire project will cost about $30,000, with pipe lines, etc. J. B. McCrary Co., Marietta Street Building, Atlanta, Ga., is consulting engineer.

Liggett & Myers Tobacco Co., Durham, N. C., let general contract to William Muirhead, Durham, for 10 one-story storage and distribution buildings near city limits. Cost about $95,000 with equipment.

Miami Brewing Co., 720 Olympia Building, Miami, Fla., Albert Weber, president, has taken over Tropical Brewing Co., same city, and will consolidate. Plans are under way for new brewery with initial capacity of about 100,000 bbl. a year. Cost over $200,000 with equipment. George Pfeifer and LeRoy Kingsport, 35 S. E. First Avenue, are architects.

City Council, Columbia, S. C., asks bids until Sept. 12 for 1,500,000-gal. elevated steel tank on steel tower of height to provide 62 ft. from top of foundation to bottom of tank. W. S. Tomlinson is city engineer.

SOUTH CENTRAL

Sautex Machine Co., 2506 East Twenty-ninth Street, Chattanooga, Tenn., manufacturer of machinery and parts, has plans for two-story and basement addition. Cost about $24,000 with equipment. R. H. Hunt, James Building, is architect.

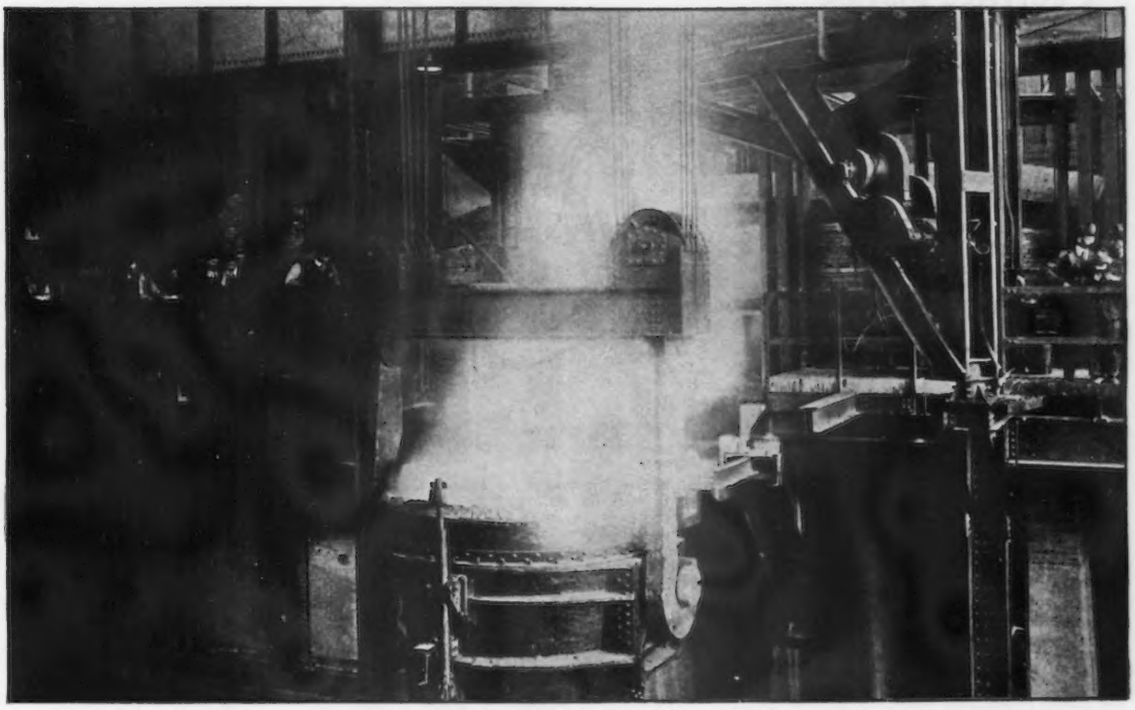
City Council, Alexandria, La., plans extensions and improvements in municipal electric light and power plant, including new equipment. Expansion in water supply and gas distribution system is also planned, with new pipe lines and operating equipment, entire project to cost over $400,000 with equipment.

Tennessee Brewing Co., Knoxville, Tenn., recently organized by Weston M. Fulton, 4270 Lyons View Park, and associates, plans extensions and improvements in building at 200 West Jackson Avenue for new plant. Cost about $75,000 with equipment.

City Council, McComb, Miss., plans installation of pumping machinery and other equipment, aeration tower and pipe lines for extensions in municipal waterworks and sewage systems. Cost about $150,000 with equipment. Henry A. Mentz & Co., Hammond, La., are consulting engineers.

Heidelberg Brewing Co., 600 Madison Avenue, Covington, Ky., has asked bids on general contract for two, three and four-story additions for brew-house, bottling works and other departments, 100 x 210 ft., with one-story boiler plant and other units. Cost about $300,000 with equipment. Richard Griesser & Son, 64 West Randolph Street, Chicago, are architects; Howard McClorey, 123 East Sixth Street, Cincinnati, is associate architect.

Falls City Ice & Beverage Co., Thirty-first Street and Broadway, Louisville, has taken out a permit for two-story power house at brewery. Cost about $30,000 with equipment.



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Chromium Metal — Chromium-Copper
Miscellaneous Chromium Alloys

SILICON
Ferrosilicon 15% — Ferrosilicon 50%
Ferrosilicon 75% — Ferrosilicon 80 to 85%
Ferrosilicon 90 to 95%
Refined Silicon (minimum 97% Silicon)
Calcium Silicon
Calcium-Aluminum-Silicon
Calcium-Manganese-Silicon
Silicon-Copper — Miscellaneous Silicon Alloys

TUNGSTEN

MANGANESE
Standard Ferromanganese 78 to 82%
Low-Carbon Ferromanganese
Medium-Carbon Ferromanganese
Manganese Metal — Manganese-Copper
Miscellaneous Manganese Alloys

SILICO-MANGANESE
All Grades including Silico-Spiegel

VANADIUM
All Grades

ZIRCONIUM
Aluminum-Zirconium — 35 to 40% Zirconium
12 to 15% Zirconium — Zirconium-Manganese-Silicon

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Chrome Briquets — Silicon Briquets
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BUFFALO DISTRICT

Leon Gas Corpn., Leon, N. Y., recently organized by Bert J. Dorsey and Richard Burgett, Leon, capital $200,000, plans development of natural gas properties in Cattaraugus County, near Leon, with installation of drilling equipment, compressor plant, pipe lines, etc.

Crucible Steel Co. of America, Inc., Syracuse, N. Y., has resumed operations at local wire mill, closed for several months, a department of Sanderson Brothers Steel Works, a subsidiary, which recently reopened.

Canisteo Sign & Mfg. Co., Inc., Canisteo, N. Y., has been organized by Harry W. Kellogg and Churchill Cobb, Canisteo, and associates, capital $225,000, to manufacture signs, electric displays, etc.

Canadian National Railway, Fort Erie, Ont., has plans for new car repair shops to replace units recently destroyed by fire, with loss of about $30,000 including equipment.

WASHINGTON DISTRICT

Procurement Officer, Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until Sept. 5 for copper angle tubes (Circular 15), aluminum hose elbows and aluminum elbow nozzles (Circular 16).

General Purchasing Officer, Panama Canal, Washington, asks bids until Sept. 5 for steel tray measuring wheelbarrows, truck casters, brass wood screws, copper tacks, sash pulleys, grindstones and other equipment (Schedule 2896), 58 tackle blocks, 16 pressure and vacuum gages, sheathing nails, wire nails, boat nails, slating nails, steel tiller rope, wire, etc. (Schedule 2897).

Henry G. Perring, Court Square Building, Baltimore, consulting engineer, will draw plans for new local distillery for company whose name is temporarily withheld. It will include power house, machine shop and other mechanical units. Cost over $125,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 5 for two 12-in. universal bevel gear generating machines, five bevel gear cutters, two universal hobbing machines, and one hand-indexing device (Schedule 638-R) for Washington Navy Yard; 10,605 steel packing boxes for smokeless powder (Schedule 580) for Indian Head yard; steel boiler tubes (Schedule 558) for Eastern and Western yards; four motor-driven milling machines (Schedule 614-R) 100 aircraft chart boards (Schedule 563) for Washington; lighting cable (Schedule 632) for Norfolk yard.

David Lynn, architect of the Capitol, Washington, asks bids until Sept. 14 for a mechanical traveling clean water intake screen and accessories, reticulated steel walks, etc., for Capitol power plant pumping station.

OHIO AND INDIANA

Columbiana Foundry Co., Columbiana, Ohio, recently organized by Lewis A. Way and Clarence A. Young, Columbiana, has taken over former McFadden Foundry, idle for about four years, and will remodel for production of special steel castings. W. V. Wallace, Columbiana, is company representative.

Columbus Dental Mfg. Co., 634 Wager Street, Columbus, Ohio, manufacturer of dental equipment, has plans for two-story and basement addition, 48 x 100 ft., with foundations for third story later. Cost over $50,000 with equipment. T. R. R. Reeves, Columbus, is architect.

Globe Wire Fence & Mfg. Co., Cincinnati, has been organized by Edward Detzel and William Katzenberger, care of Fred W. Lawrence, 618 First National Bank Building, representative, to manufacture wire fencing and other wire products.

Vitrified Iron Products Co., Clyde, Ohio, plant and property, has been purchased by a bondholders' committee, headed by William Dave. Plans are being considered for reorganization and resumption of operations.

Village Council, Hamden, Ohio, plans installation of pumping machinery and other equipment, pipe lines, and elevated steel tank and tower for new municipal water system. Cost about $57,000. H. E. Kimberly, 586 East Broad Street, Columbus, Ohio, is consulting engineer.

Milan Brewing Co., Milan, Ohio, will take bids soon on general contract for new multi-story brewery, with brew-house, bottling, mechanical-cooling and other departments, including boiler house. Cost over $100,000 with equipment. E. A. Broberg, Lorain-Fulton Building, Cleveland, is architect.

Container Corpn. of America, Inc., 111 West Washington Street, Chicago, manufacturer of corrugated and other paper boxes and containers, has approved plans for two-story addition to plant at Carthage, Ind., 58 x 138 ft. Cost about $35,000 with equipment.

Seymour Refinishing & Machine Works, Inc., Seymour, Ind., has been organized by Earl N. Crawford and Ivan Bullock, Seymour, to manufacture machinery and parts, and operate a general machine works.

Simmons Mfg. Co., 3405 Perkins Avenue, Cleveland, has purchased from Federal Screw Co., Detroit, plant formerly occupied by Superior Screw & Bolt Co., East Ninety-third Street and Aetna Road, Cleveland. Plant buildings occupy 100,000 sq. ft. on a 3½-acre site. Simmons company manufactures automobile parts and accessories, including mufflers, carburetors, and hydraulic jacks. Charles F. Groth is president.

SOUTHWEST

City Council, Kennett, Mo., has been authorized to arrange bond issue of $140,000 for new municipal electric light and power plant, using Diesel engine-generator units, and electric distribution system. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Electro-Element Corpn., St. Louis, has been organized by George Diedereck, 8500 Goodfellow Avenue, and associates, to manufacture electrical equipment and appliances.

Dewey Portland Cement Co., 101 West Eleventh Street, Kansas City, Mo., has approved plans for one-story addition to mill at Dewey, Okla., for new clinker unit, with installation of electric traveling crane and other mechanical-handling equipment. Cost over $40,000 with equipment.

Common Council, Wayne, Okla., plans installation of pumping machinery and auxiliary equipment, elevated steel tank and tower, pipe lines, etc., for municipal waterworks. Cost about $30,000. W. B. McMasters, 603½ West Main Street, Oklahoma City, Okla., is consulting engineer.

A. B. C. Brewing Corpn., Broadway and Dorcas Street, St. Louis, affiliated with American Brewing Co., same address, plans modernization and improvements in plant, to include additional equipment. Cost over $80,000 with machinery.

Common Council, Leslie, Ark., plans installation of elevated steel tank and tower, pumping machinery and auxiliary equipment, pipe lines, etc., for new municipal waterworks. Cost about $60,000. Christopher L. Wright, Pine Bluff, Ark., is consulting engineer.

Southwest Brewing Corpn., Oklahoma City, Okla., recently organized by Nicholas A. Schlangen, 2435 Irving Park Boulevard, Chicago, and associates, has acquired property of New State Ice Co. and will remodel for new plant. Cost over $125,000 with machinery.

Carlisle Machine Works, Inc., Longview, Tex., has been organized by Claude Carlisle and A. A. Gunter, Longview, to manufacture machinery and parts, and operate a general machine works.

Common Council, McKinney, Tex., plans installation of deep-well pumping machinery and auxiliary equipment for extensions in municipal water system. Cost over $40,000. Koch & Fowler, Central Bank Building, Dallas, Tex., are consulting engineers.

Town Council, Rockdale, Tex., is considering new municipal electric light and power plant. Cost about $50,000 with equipment.

WESTERN PENNA.

Durable Products Co., Sheffield, Pa., recently organized to manufacture metal specialties, has taken over former plant of Sheffield Furniture Co., for new works.

Gulf Refining Co., Frick Annex, Pittsburgh, has approved plans for addition to oil refinery at Neville Island, to handle crude oil from its properties in Bradford, Pa., oil district. Cost over $200,000 with equipment.

Keystone Box Co., Twenty-eighth and Smallman Streets, Pittsburgh, manufacturer of corrugated paper and cardboard boxes and containers, has let general contract to Austin Co., for six-story and basement addition. Cost over $100,000 with equipment.

McKeefrey Coal Co., McKeefrey, W. Va., is planning new coal-loading tipple on Ohio River waterfront. Headquarters are at Leetonia, Ohio.

Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, Paint and Varnish Division, has awarded general contract to Rainey & MacIsaac, 2100 East Twenty-fifth Street, Los Angeles, for three-story plant unit, 32 x 65 ft., at Florence, near Los Angeles. Cost over $70,000 with equipment. H. Du Pre Bountheau, 222 South Clifford Avenue, Brentwood, Cal., is supervising architect.

MIDDLE WEST

Florence Stove Co., Kankakee, Ill., manufacturer of electric and gas stoves, parts, etc., has plans for addition, to cost over $40,000 with equipment. Frank D. Chase, Inc., 307 North Michigan Avenue, Chicago, is architect and engineer. Headquarters are at Gardner, Mass.

United Brewing Co., Gilmer, near Lake Zurich, Ill., will take bids soon on general contract for two-story and one and one-half story additions, including remodeling of present plant. New equipment will be installed. Cost over $85,000 with machinery. Hermann J. Gaul, 228 East Superior Street, Chicago, is architect.

Tousey Varnish Co., 520 West Twenty-fifth Street, Chicago, plans rebuilding three-story storage and distributing plant, including tanks and other equipment, recently destroyed by fire. Loss over $100,000 with equipment.

Gilco Mfg. Co., 3264 Grand Avenue, Chicago, has been organized by John C. and Alvin L. Kayner, to manufacture metal stampings, spun metal goods, lamp parts, etc.

Schatsbrau Brewing Co., Melrose, Minn., will take bids at once for new three-story and basement plant, 80 x 180 ft. Cost about $170,000 with equipment. L. F. Schafhausen, 2652 Bryant Avenue South, Minneapolis, is architect.

Common Council, Osceola, Iowa, asks bids until Sept. 11 for high and low-lift pumping machinery, filter equipment, pipe lines, etc., for extensions and improvements in municipal waterworks. Cost about $70,000. Lafayette Higgins, Jr., Hubbell Building, Des Moines, Iowa, is consulting engineer.

Duluth Brewing & Malting Co., Twenty-ninth Avenue West and Helm Street, Duluth, Minn., Carl Meekse, in charge, plans extensions and modernization in former Rex Brewery, location noted, to include additional equipment. Cost about $200,000 with machinery.

Common Council, Wapello, Iowa, has been authorized to arrange bond issue of $107,000 for new municipal electric light and power plant. Bids will soon be asked. H. L. Cory Co., Baum Building, Omaha, Neb., is consulting engineer.

United States Brewing Co., 2519 Elston Avenue, Chicago, plans rebuilding part of plant recently destroyed by fire. Loss close to $100,000 with equipment.

Common Council, Pierre, S. D., asks bids until Sept. 5 for oil burner equipment for power plant, including automatic stack control, temperature thermostat, etc., with 1500-gal. steel fuel tank.

JOBBERS who serve the Mississippi Valley, the West, and the Southwest find our mill warehouse a better source of supply for meeting the "hurry-up" needs of contractor and fabricator. Stocks of sheets and plates in a complete variety of standard weights and sizes are available for immediate shipment. Prompt delivery is assured thru an ideal location at Granite City, Illinois, only 20 minutes from Saint Louis, served by 29 railroads and the Mississippi River.

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GRANITE CITY STEEL CO

GRANITE CITY, ILLINOIS

Water Department, Watertown, Wis., will take bids soon for electric-operated centrifugal pumping machinery, capacity about 1200 gal. per min., with auxiliary equipment, for municipal waterworks. E. B. Parsons, 419 North Washington Street, is engineer.

Keith Dunham Co., 110 South Dearborn Street, Chicago, manufacturer of industrial oxygen plants and equipment, plans new factory adjoining works of subsidiary, Gas Products Co., 3965 Jennings Road, Cleveland, where 5-acre tract is available. Cost about $100,000 with equipment. Superstructure will begin in September. M. Keith Dunham is president of both organizations.

MICHIGAN DISTRICT

Oakman Brewing Co., 2537 Book Tower Building, Detroit, recently organized by Charles G. Oakman and associates, capital $1,250,000, has plans for remodeling and expanding former bakery at Ten Mile Road and Grand Trunk Railway for new brewery. Three-story addition will be built for brew-house and mechanical-bottling department. Cost over $175,000 with equipment. G. A. Mueller, 1346 Broadway, is architect.

A. A. Brewing Co., 416 Fourth Street, Ann Arbor, Mich., C. Stanley Thomas, 11411 Evanston Avenue, Detroit, secretary-treasurer, recently organized, has taken over former plant of Michigan Union Brewing Co., address noted, and will modernize and expand. New equipment will be installed. Cost over $150,000 with machinery. Christian Mack is president.

Eaton-Erb Foundry Co., Vassar, Mich., has plans for two one-story additions. One of the units will be equipped for air compressor and cleaning service. Cost about $20,000 with equipment.

Ace Drill Co., Detroit, has been organized by Robert B. Bleecker, 13835 Jennings Avenue, and associates, capital $30,000, to manufacture twist drills and other cutting tools.

Common Council, Morenci, Mich., plans installation of deep-well pumping machinery and other equipment, elevated steel tank and tower, pipe lines, etc., for extensions in municipal waterworks. G. C. Dailey, Morenci, is engineer.

Ypsilanti Brewing Co., Ypsilanti, Mich., plans addition; cost over $80,000 with equipment.

PACIFIC COAST

La Canada, Ltd., San Diego Trust & Savings Building, San Diego, Cal., B. C. Morrison, president, has approved plans for new gasoline refinery on waterfront, with steel tanks and storage and distributing facilities. Cost over $125,000 with equipment.

Sonoma Valley Brewing Co., 7 College Avenue, Santa Rosa, Cal., plans extensions and improvements in three-story plant, including equipment. Cost about $100,000 with machinery. Michael J. Hanrahan, 300 Stanyan Street, San Francisco, is president.

Commonwealth Consolidated Gas Co., 1009 West Seventh Street, Los Angeles, has plans for new carbon black producing plant in Kettleman Hills, Cal., district, including compressor station, pipe lines for natural gas supply, etc. Cost close to $100,000 with equipment.

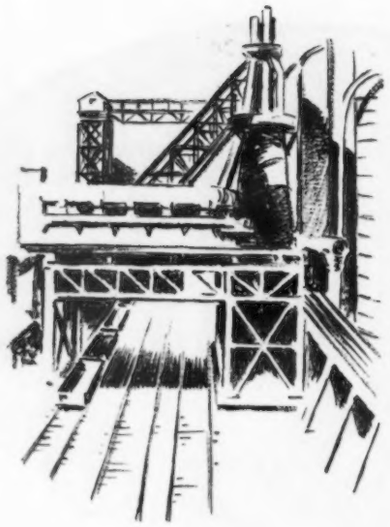
California Sanitary Canning Co., 4922 Long Beach Boulevard, Los Angeles, Cal., has let general contract to A. V. Perkinson, 3977 South Vermont Avenue, for one-story addition, 150 x 165 ft. C. A. Balch, 1914 South Vermont Avenue, is architect.

Star Brewing Co., Vancouver, Wash., recently organized, care of Richard Ullrich, Smith Tower Annex, Seattle, engineer, has plans for three and five-story plant on site of old Star Brewery, 60 x 90 ft. Cost about $200,000 with equipment. George H. Gage, Portland, will be president.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 5 for 65 worm gear chain hoists (Schedule 585), 5800 lb. copper tubing (Schedule 581), and 456 steel measuring tapes (Schedule 586) for Mare Island Navy Yard.

Santa Lucia Wineries, Inc., Fresno, Cal., has authorized new plant on former site of Goldkist Packing Co., with storage and distribution department for capacity of 1,000,000 gal. at one time. Cost about $200,000 with equipment. John H. Arkelian, Turlock, Cal., is president; Henry Krum, Fresno, will be company official and plant superintendent.

Seattle Macaroni Mfg. Co., 1416 Dearborn Street, Seattle, has asked bids on general contract for one-story addition, 100 x 160 ft. Cost over $40,000 with equipment. B. Dudley Stuart, Arcade Building, is architect.



Board of Education, Riverside, Cal., has authorized plans for one-story vocational shop at Polytechnic high school, to replace an old unit. Cost over $35,000 with tools and equipment. G. Stanley Wilson, Mission Inn, is architect.

City Council, Eureka, Cal., plans municipal hydroelectric power house on Mad River, with transmission line to city for light and power. Cost about $1,200,000 with equipment. Installation of pumping machinery and auxiliary equipment for new municipal water system also is planned, to cost about $350,000. C. C. Kennedy, 74 New Montgomery Street, San Francisco, is consulting engineer.

FOREIGN

Imperial Chemical Industries, Ltd., London, England, has approved plans for new works at Billingham-on-Tees, England, for production of gasoline from coal, to include power house, machine shop and other structures. Cost over $7,000,000.

Board of Commissioners, San Juan, Puerto Rico, W. I., is disposing of bond issue of $434,000 and will later sell additional issues to gross amount of $1,300,000, proceeds to be used for extensions and improvements in city waterworks and system, including pumping and power equipment, booster stations and other structures, pipe lines, etc. J. Benitez Castano is city manager in charge.

Ministry of Communications, Government of Brazil, Rio de Janeiro, is securing federal appropriation of about $900,000 for new airplane and dirigible base, with hangars, repair and reconditioning shops, oil storage and distributing tank units, and other structures. Project will be carried out in cooperation with Zeppelin Co., Ltd., Berlin, Germany, which proposes to inaugurate a dirigible service from Friedrichshafen, Germany, to Rio de Janeiro.

TRADE NOTES

Allsteel Press Co., 12015 South Peoria Street, Chicago, maker of punch presses and sheet metal working machinery, has appointed E. H. Merrick, Cook Building, Cleveland, as exclusive representative in the Cleveland district.

Blackburn Foundry Co., Cincinnati, has been organized through the purchase, from the receiver, of Elmwood Castings Co. The purchasers who become executive officers of the new company are: S. M. Blackburn, president; P. E. Cline, treasurer; A. C. Pletz, secretary and general manager, and E. F. Rogers, vice-president and works manager. The company will make a complete line of gray iron castings in both light and heavy classifications.

TRADE PUBLICATIONS

Industrial Truck Tires.—B. F. Goodrich Co., Akron, Ohio. Folder showing savings by use of rubber tires on industrial trucks, hand and power.

Die Castings.—New Jersey Zinc Co., 160 Front Street, New York. Circular outlining A. S. T. M. proposed tentative specifications for zinc base alloy die castings, also specifications of the company's Zamak die casting material.

Gas Analyzer.—Bacharach Industrial Instrument Co., Pittsburgh. Bulletin 255 describing model RZA combustible gas analyzer for testing furnace atmosphere. Two types are made, for portable service and for permanent installation, respectively.

Gear-Motors.—General Electric Co., Schenectady, N. Y. Circular devoted to fractional-horsepower gear-motors of concentric and right-angle-shaft type.

Welding and Cutting Equipment.—Torchweld Equipment Co., Chicago. Catalog and price list of gas welding and cutting torches, gas pressure regulators, pressure gages, torch wheel guides and welding goggles.

Molybdenum.—Climax Molybdenum Co., 295 Madison Avenue, New York. Attractive booklet of 52 pages. Part 1 is devoted to properties imparted to steel by the addition of molybdenum; Part 2, commercial molybdenum steels; Part 3, steel castings and Part 4, molybdenum in cast iron.

Steel Pipe Fittings.—Taylor Forge & Pipe Works, Chicago. Bulletin describing a new line of fittings for light wall piping and Taylor spiral pipe.

Motors.—Wagner Electric Corpn., St. Louis. Bulletin 167 devoted to long-hour duty split-phase motors.

Reduction Gears.—Poole Foundry & Machine Co., Baltimore. Catalog describing single, double and triple herringbone gear units. Separate dimension sheets are included.

Diesel Engines. — Busch-Sulzer Bros.-Diesel Engine Co., St. Louis. Lower power costs for ice and refrigeration application of Diesel engines are outlined in a new 12-page bulletin.

X-Ray Equipment.—Industrial X-Ray Corpn., Los Angeles. Bulletin describing the Philips Metalix portable X-ray equipment. Illustrations include actual applications.

Steel Castings Up In June

WASHINGTON, Aug. 29.—Orders for commercial steel castings in June rose to 32,026 net tons or 21.8 per cent of capacity compared with 20,782 tons or 14.1 per cent of capacity in May, according to reports received by the Bureau of the Census from 128 establishments. The June output totaled 27,300 or 18.6 per cent of capacity as against 19,072 tons or 13 per cent of capacity in May. In the first six months of 1933 orders aggregated 103,572 tons or 11.8 per cent of capacity compared with 86,354 tons or 9.8 per cent of capacity in the corresponding period of last year.

BETTER PRODUCTS COME FROM BETTER PIG IRON

About 80% of the pig iron produced in this country is used in the making of steel. Most of the remaining pig iron finds its way into gray and malleable castings with a market value of close to a billion dollars annually. With 5,000 foundries in operation in normal times, it is reasonable to conceive that keen competition exists within the industry—a competition that makes constant demands for bettered products.

Republic is helping foundries seeking for higher quality in the finished castings by supplying two dependable grades of iron.

NIAGARA is a uniform iron made from Lake Superior ores by a carefully-controlled process. Its uniformity and scrap-carrying qualities have earned for it an enviable reputation. It is made in foundry and malleable grades.

PIONEER is a clean, chill cast southern iron uniform in weight and analysis. For years it has been a favorite among exacting foundrymen.

Foundries looking for ways to better quality should make tests to determine the improvement that Republic Pig Iron will produce.

REPUBLIC STEEL
CORPORATION
GENERAL OFFICES: YOUNGSTOWN, OHIO

Continuous-Type Furnaces Employed in Forging Aluminum Alloys

(*Concluded from Page* 23)

treated to increase their strength. This heat treatment is accomplished in two low and medium temperature furnaces of opposite types. One is a cylindrical oven, electrically heated and equipped with four fans; the other is quite similar to the forging furnaces already described except that it is of the batch type, as is also the electrically-heated oven.

The forgings are handled in trays and two of these trays are lowered into the first furnace. The trays are handled by a post with arms, that is raised and lowered with a hydraulic lift. When the work has been heated in the first oven the trays are rolled out on to the carrier, lowered into the quench, lifted out and then rolled into the second oven, which holds four trays. The first furnace is 5 ft. in all dimensions while the second is 8 ft. high, 4-ft. square in cross section. Built of sheet steel and insulated it is equipped with angle iron and rollers, at each of the four levels, so that the trays roll in easily, from the lift, which raises them to any level.

This oven is heated by a separate heater, like the forging furnace described, except that it is located on the floor, to one side, and a hairpin duct, with motor-driven fan, is employed to circulate and recirculate the heated air. A bleeder in this duct is used to discharge the makeup from the combustion chamber. At the point where the heater discharges into this duct there is a butterfly valve so that the heat is forced first into the top of the oven and out at the bottom, and then in at the bottom and out at top and back through the heater. This intermittent action causes considerable turbulence of the heat in the oven, forcing the heat continually to all parts of the work. This takes the place of the baffled or sawtoothed effect in the continuous furnaces and provides the same with a high degree of efficiency. The burners and temperature controls are of the same type as those already described.

An important factor in this type of unit is that the work can be heated from two to four times as fast as it can be heated in a direct-fired gas furnace or in an electric furnace with the element inside. Further, the temperature control can be set within 5 deg. of the temperature to which the work is to be heated and the pieces will have no readable temperature variation. Inasmuch as there is nothing in the oven that is at a higher temperature than the heating air, there is no chance of the work becoming overheated even should the conveyor stop due to motor failure.

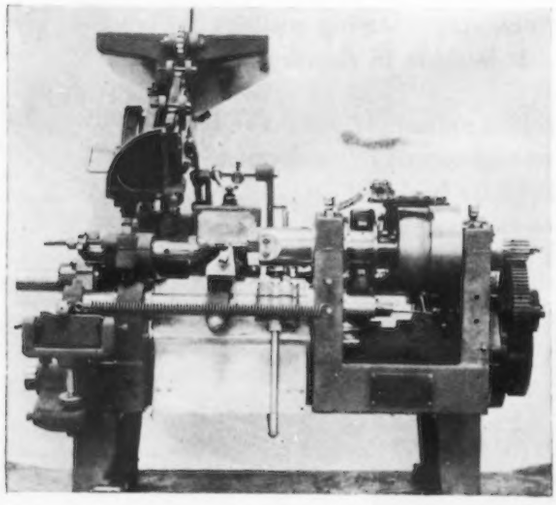
Improved Wood Screw Manufacturing Machine

HIGH production at normal spindle speeds is claimed for the improved wood screw pointer and threader recently announced by the H. P. Townsend Mfg. Co., Hartford, Conn. The high production is attributed to the arrangement of the cams and tool movements, which eliminate lost time, and to the firmness with which either oversize or undersize heads are held by toggle operated jaws. Because of the latter a smaller number of cuts is required. Operation is continuous; this is due not only to the efficient feeding mechanism employed but to ease of screw adjustments, many of which can be made while the machine is in operation.

A feature of these machines is that they can be arranged for cutting single, double and triple threads. This, it is pointed out, permits production of the double-thread wood screws, which, in starting easier and staying central with the starting point, are said to overcome the eccentric movement of the usual single-thread wood screw and thus prevent displacement of metal parts that are to be attached to the wood. This screw is also said to turn easier and faster, with less danger of splitting the wood.

The machines are built in three sizes for pointing and threading the full list of U. S. and Manufacturers' threads. The spindle of the machine, of solid steel, is of two-jaw type and has oversize ball bearings for taking belt pull, gear pressure and end thrust. The machines are arranged for overhead jackshaft drive, leaving space underneath the tables for storage. Solid cut cams are used; they are mounted on the end of the camshaft and are easily changed. Changing of gears and leader cams has also been simplified.

Jaw grips in the spindle will hold two or three different sizes of heads by a simple adjustment at the rear end of the spindle. These grips are interchangeable and may be replaced without removing the spindle from the machine. A backrest supports the work during the cutting operation; the backrests are adjustable in two directions to give proper contact with the blank.



HIGH production in pointing and threading wood screws is attributed to the arrangement of cams and tools and the facilities for firmly holding oversize and undersize heads.

Corrosion Effects of Lubricants

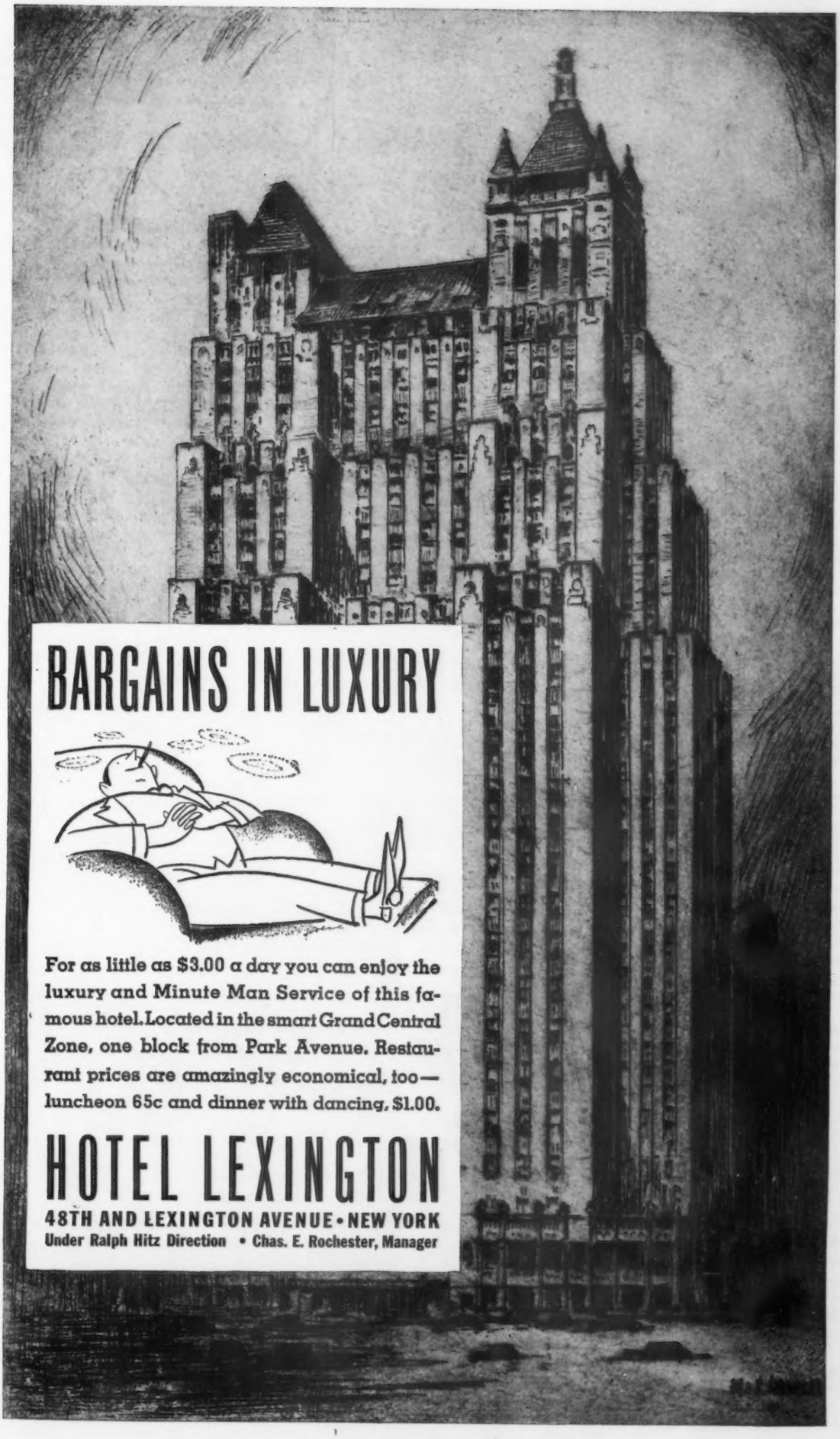
(*Concluded from Page* 21)

(2) They may have a slight selective corrosion effect upon the softer formations. Such an effect if in a limited degree may prove distinctly beneficial in bearing performances.

(3) They may have an excessive selective corrosion effect upon the softer formations, causing chemical pitting and undermining the support of the harder crystals with a consequent reduced bearing life.

(4) They may have a selective corrosion effect upon the harder formations, thereby destroying both the bearing value and life of an alloy.

(5) They may corrode all phases of an alloy and thereby produce a general destructive effect.



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48TH AND LEXINGTON AVENUE • NEW YORK

Under Ralph Hitz Direction • Chas. E. Rochester, Manager

From Power to Pills to Plastic Products

(*Concluded from Page* 19)

The company has a large variety of pre-form dies so that almost any molding job can be done economically.

approximating the final size is first machined and then hobbed. Hobbed dies can be made up to about 10 in. in diameter, although usually they are much smaller. If only one die is required, the cost of making a hob to produce it would be prohibitive, but hobs are indispensable where duplicate dies are needed.

When urea resins are molded, a so-called breathing operation must be provided. That is, after the powder or pill has been closed in the mold, it is necessary to open the mold to allow the accumulated gases to escape, thus preventing the molded product from blistering or discoloring. The exact time for doing this is a matter of experimentation according to the size and shape of the product. Incidentally urea resins are molded at lower heats and higher pressures than phenolic resins, from which the company also makes plastic products. The steam pressure used in molding urea resins is from 50 lb. per sq. in. (281 deg. F.) to 120 lb. (340 deg.), whereas phenolic resins are molded at 150 lb. (360 deg.). Molding temperatures are dependent in large measure on the design of the mold and of the product.

At the beginning of the molding operation when thermo plastic compounds are used, the mold is heated to 360 deg. F. and the plastic material put in. The mold then is closed and the heat shut off, the mold being cooled to room temperature by water flowing through heater plates which are built integrally with the molding dies. These plates are similar in design to a hot-water radiator, being cross drilled so as to permit the steam and cold water to pass in criss-cross fashion from one side to the other and thus give the plates a uniform temperature. They are made of low-carbon steel which does not need hardening.

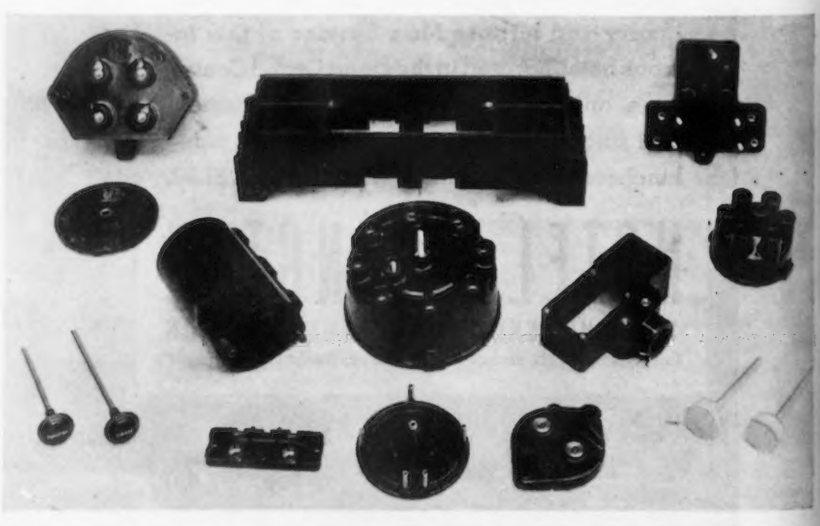
This cooling operation is not applied in all molding cycles, some articles being adapted to production in a hot mold. Cooling is usually resorted to for an especially lustrous finish or when close tolerances are desired.

During the molding cycle molded articles have a tendency to shrink from 0.006 in. to 0.008 in. To insure given tolerances when the articles are ejected from the molds, these shrinkages must be taken into consideration in designing the mold. It is possible, but not practical, to hold tolerances to 0.001 in.; generally a tolerance of 0.003 in. is satisfactory.

Small parts often are made in hand molding presses rather than in mechanically operated presses. The hand molding process is essentially the same as the mechanical process, except that the molds are removed from the press to a bench for loading and unloading. The molds are less expensive to make because of the fewer number of units and because neither the stripper mechanism nor the heater plate equipment is necessary.

Weights of materials placed in the molds are closely controlled to prevent waste in the form of overflow flash. From the molding presses the cast parts are taken to the finishing department where rough edges are removed in various ways. Some are spun in small bench lathes, others are handled by hand and the flash removed with files, and still others are tumbled in barrels with various media for removing the flash. Small holes are drilled and tapped in the molded parts by means of suitable bench-type machines. When a high lustre is desired, the work often is buffed and polished.

At the Reynolds plant a large variety of pre-form dies are available so that almost any molding job can be done economically. At times, however, it is essential to build special pre-form dies for a particular product because of its complicated shape and of the possibility of having to mold in place a number of metal inserts.



A group of finished products made by the Reynolds company. Note the metal inserts.

Y-NINTH YEAR OF SERVICE TO THE METAL WORKING INDUSTRY SEP 9 1933

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THE IRON AGE

DUCTION -:- MANAGEMENT SEPTEMBER 7, 1933 PROCESSES -:- NEWS

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The Difference Between Roll Neck Bearing Success and Failure

THE definite engineering knowledge that goes with every application of Timken Roll Neck Bearings is one of the strongest factors in their success. Without this knowledge every bearing placed on a roll neck would be more or less of an experiment.

It took Timken engineers over ten years to acquire the knowledge they are applying to roll neck bearing design and application so successfully today.

This means that Timken is at least ten years ahead in this particular phase of mill modernization. It is the difference between certainty and uncertainty... between success and failure for the mill installation.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *Tapered Roller* **BEARINGS**

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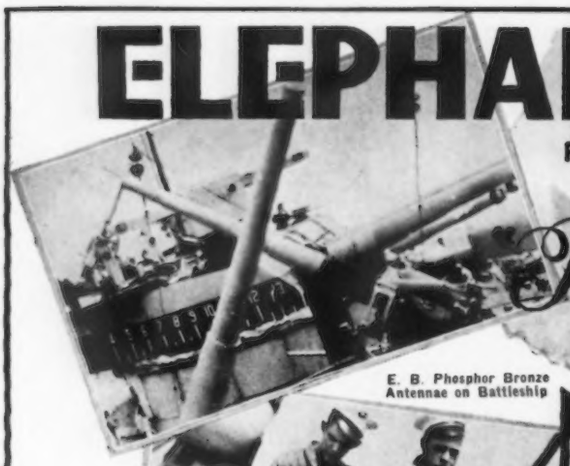
"Phosphor Bronze In the NAVY"



E. B. Phosphor Bronze Antennae on Battleship

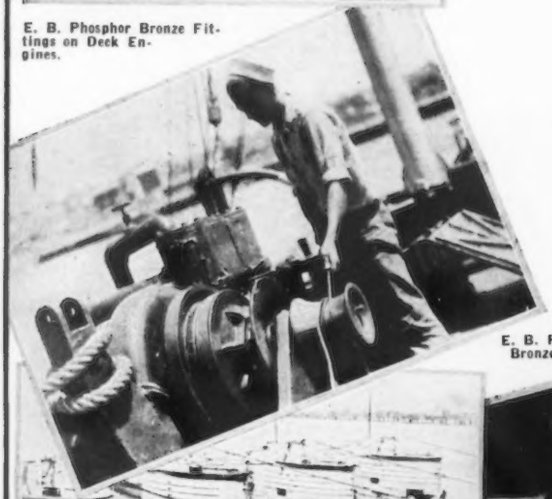
E. B. Phosphor Bronze Cleaning Rods and Button Polishers.

E. B. Phosphor Bronze Fittings on Deck Engines.

The United States Navy is one of the largest users of Phosphor Bronze in the world. This arm of our government finds that where precision in use, strength, durability, uniformity and economy are demanded Elephant Brand Phosphor Bronze proves absolutely reliable.

Industry, exacting in processes and product, also uses Elephant Brand Phosphor Bronze for bushings, bearings, gears, valves, cylinder linings, rods, bolts, wire propellers, marine hardware and many other purposes because of its exclusive advantages. Elephant Brand Phosphor Bronze is furnished in ingots, castings, rods, wire, sheets, ropes, tubes.

THE PHOSPHOR BRONZE SMELTING COMPANY
2200 WASHINGTON AVENUE, PHILADELPHIA, PA

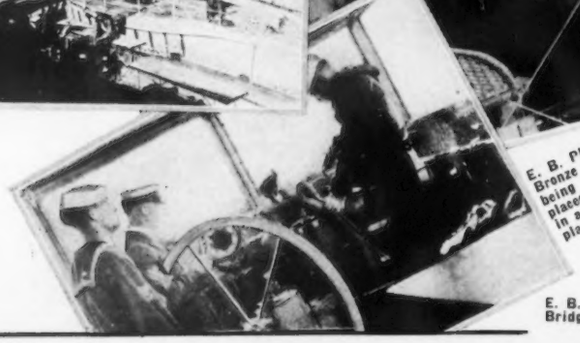


E. B. Phosphor Bronze Gears.

E. B. Phosphor Bronze in Submarines.

E. B. Phosphor Bronze Wire being placed in airplane.

E. B. Phosphor Bronze fittings in Destroyer Engine Room.



E. B. Phosphor Bronze Bridge Fittings.

THE IRON AGE, published every Thursday by the *IRON AGE PUBLISHING CO.* Publication Office: N. W. Cor. Chestnut & 56th Sts., Philadelphia, Pa. Executive Offices: 239 W. 39th St., New York, N. Y., U. S. A. Entered as second class matter at the Post Office at Philadelphia under Act of March 3, 1879. $6.00 a year in U. S., Canada $8.50, Foreign $12.00. Vol. 132, No. 10.